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By-Thurston, John R.; And Others

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Specific aims of Phase III, planned as a 4-year program, included: (1) evaluating the efficiency of three instruments--Nursing Sentence Completions (NSC), Nurse Attitudes Inventory (NAI), and Luther Hospital Sentence Completions (LHSC)--for the prediction of success early in nursing school, (2) developing attitudinal area scores for the three instruments, (3) developing the Empathy Inventory (EI), a research tool to explore the role of faculty and schools in precipitating underachievement, withdrawal, and failure, and (4) testing the generality of results and promoting the use of the tests. Because funding was available for only 1 year, the research objectives could be realized only in part. Some results were: (1) elicitation of responses related generally to success or failure, and (2) variation among schools in the magnitude of relationships. Exploration of the psycho-social climate of nursing schools and the use of NSC scores in concert with a qualitative analysis of individual responses as bases for remediation of students' problems were recommended. The NSC, NAI, and EI are discussed in detail. A special study involving Purdue's five associate degree programs is presented. Phase I and II are available as VT 009 168. (JK)

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THE PREDICTION OF SUCCESS IN NURSING EDUCATION

PHASE III, 1967-1968

John R. Thurston, Ph.D.
Wisconsin State University, Eau Claire, Wisconsin

Helen L. Brunclik, R.N., M.N.
St. Joseph's School of Nursing, Marshfield, Wisconsin

John F. Feldhusen, Ph.D.
Purdue University, Lafayette, Indiana

VT007896

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PHASE III, 1967 - 1968

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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John R. Thurston, Ph.D.
Wisconsin State University, Eau Claire, Wisconsin

Helen L. Brunclik, R. N., M. N.
St. Joseph's School of Nursing, Marshfield, Wisconsin

John F. Feldhusen, Ph.D.
Purdue University, Lafayette, Indiana

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1968

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In two previous reports we have had occasion to express our appreciation to those persons who have helped to make our research possible. As we prepare the report for Phase III and look back over the nine years of our study, we are more cognizant than ever of the contributions that others have made to our work.

We are particularly indebted to certain individuals who have shared the trials, tribulations, and triumphs of the study since the project was approved. Our very special thanks go to:

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John R. Thurston
Helen L. Brunclik
John F. Feldhusen

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Chapter I

The Relationship Of Personality To Achievement In Nursing Education, Phases I and II*

Approximately one out of three students entering nursing education fails to graduate (Tate, 1961). This high dropout rate poses serious problems to a nation faced with a severe shortage of qualified nurses. A report from the Surgeon General (1963) recommended a yield of 53,000 graduates per year by 1959. The high rate of withdrawal from nursing schools will be a major factor determining whether or not this goal can be reached (Brunclik and Thurston, 1965).

Research on the problem of nursing student failure and withdrawal has focussed on personal, educational, and intellectual factors. After a review of research on the prediction of success in nursing education, Taylor (1963) concluded that scholastic grade-point averages and scores from intelligence and achievement test batteries are the most accurate predictors. Taylor suggested that the usual psychological measures of motivation, interest, and personality of student nurses contribute little to the prediction of success or failure.

Phase I

Marie Farrell recommended that projective tests should be used to predict achievement in nursing education (1954). Mindess has reported success in prediction through the use of projective techniques (1957). Thus, a decision was made to construct and validate a projective device, the Luther Hospital Sentence Completions (LHSC). This test was designed for the specific purpose of evaluating attitudes and emotional reactions regarded as vital to good nursing. The development of this 90-item form has been described elsewhere (Thurston, Finn, and Brunclik, 1963). A Nursing Education Scale (NES) was then developed as a scoring standard for LHSC responses (Thurston and Brunclik, 1965). NES scores would provide a basis for the prediction of achievement of prospective nurses.

Phase I of the Luther Hospital Research Project was devoted primarily to the construction and validation of the LHSC as scored with the NES, Preliminary Form. Also studied were the relationships between nursing school achievement and performance on the NLN Pre-Nursing and Guidance Test (PNG), the Minnesota Multiphasic Personality Inventory (MMPI), and the Rotter Incomplete Sentence Blank (ISB).

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*an edited form of this chapter appears as: Thurston, J. R., Brunclik, H. L., and Feldhusen, J. R. "The Relationship of Personality to Achievement in Nursing Education, Phase II," Nursing Research, In press.

The major Phase I (Thurston and Brunclik, 1965) findings were as follows: (1) Cross-validation of the LHSC as scored with the NES, Preliminary Form, revealed significant differentiations between achievers and failures, but not between underachievers and failures nor between achievers and underachievers; (2) There were few significant relationships between MMPI performance and achievement groupings; (3) There were no significant relationships between Rotter ISB performance and achievement groupings; (4) A significant difference between schools was noted in terms of Rotter ISB scores; and (5) Underachievers scored higher on the PNG than achievers or failures, who, in turn, scored higher than rejects (those not admitted).

Phase II

Phase II of this research was chiefly a replication of Phase I. Specific aims of Phase II were those students who would be classified as achievers, underachievers, and failures.

1. To conduct a cross-validation of the Nursing Education Scale (NES), a revision of NES, Preliminary Form, for scoring of the LHSC in terms of identifying prior to admission;
2. To re-assess the power of the MMPI to identify, prior to admission, those applicants who would ultimately be achievers, underachievers, or failures; and
3. To re-evaluate the relationship of pre-admission Rotter ISB performance to later status of students as achievers, underachievers, or failures.

Two cross-validations of NES-LHSC scoring were carried out, one involving a new student population from schools which had served in the derivation and initial cross-validation of the NES, Preliminary Form, and one involving a student population from a school that had participated in neither of these endeavors. In Phase II the overall NES score was broken down into six attitudinal area scores: Nursing, Self, Home-Family, Responsibility, Others-Love-Marriage, and Academic. Each sub-score was derived from NES scoring of the LHSC stems which were related to those areas.

Method

Three schools of nursing participated in Phase II; Luther Hospital School of Nursing (Luther), Eau Claire, Wisconsin; Holy Family School of Nursing (Holy Family), Manitowoc, Wisconsin; and Madison General Hospital School of Nursing (Madison General), Madison, Wisconsin.

Personality Measures. Every applicant submitting a formal application to any of the three schools was tested by means of a mailed test packet. One test envelope contained the LHSC, a second the Rotter ISB, and a third the MMPI. Detailed directions to the students were included. When all three tests were finished, the applicant was instructed to return them to the school to which she had applied.

Faculty Evaluation Committee. The participating schools were responsible for the selection of faculty committees to evaluate each student after she had been in school for approximately eighteen months. Each committee was composed of five faculty members who had been associated with a specific student, and who had direct personal knowledge of her performance for at least three months. Committee membership varied from student to student. The achievement ratings (achiever and underachiever) were made by the faculty committee while failures were determined by a review of school records.

Scoring Reliability

To determine the reliability of NES-LHSC scoring, fifty pre-admission LHSC records of applicants were selected on a random basis from applicants to Luther and Holy Family. The LHSC's were scored by a psychologist, three nurses, a social worker, and a university student majoring in psychology. The Pearson product-moment correlations ranged from .67 to .89. These findings were interpreted as indicating a satisfactory level of scoring reliability although there was evidence to suggest that experience in scoring sentence completions as well as formal training in psychology would increase the scoring reliability.

Summary of Results

The NES-LHSC Total Scores ranged from 65 to 84. The means for the achievement groups are given in Table 1.1. For Luther the means were 73.46 for achievers, 74.59 for underachievers, and 77.88 for failures while at Holy Family the means were 74.68, 75.18 and 77.00 for the same groups respectively. The analyses of variance of NES-LHSC scores for Luther and Holy Family schools and for Madison General are given in Table 1.2. The F ratio for achievement status at Luther and Holy Family was 20.76 (2 and 192 d.f.) which was significant at the .01 level. The differences between achievers and failures and between underachievers and failures were significant but the differences between achievers and underachievers were not.

The analysis of variance for Madison General revealed a significant F ratio of 3.37 (2 and 244 d.f.) for achievement level. The means for these achievement groups are 74.07, 75.16, and 75.22 for achievers, underachievers, and failures respectively as shown in Table 1.1. The differences between achievers and underachievers and between achievers and failures were significant but the difference between underachievers and failures was not.

Analyses of variance were also computed for attitudinal area scores. At Luther-Holy Family, significant differences were noted between achievement status levels in several attitudinal area scores (Self, Home-Family, Responsibility, Others-Love-Marriage, and Academic). At Madison General a significant difference was noted among achievement level scores for Home-Family attitudes.

No significant results were found in the analyses involving the MMPI. Although the analysis of variance for the Paranoia scale revealed an F ratio which was significant, further investigation of differences among the achievement group means revealed none to be significant. No significant inter-school differences on the MMPI were noted.

No significant differences in ISB scores were found among the achievement levels. However, between-school comparisons showed that Luther applicants scored higher than those applying to the two other schools to a degree approaching significance at the .05 level.

Discussion

This phase of the research was a further analysis of the relationship of personality to achievement status. The design involved a partial replication of research previously reported in Phase I. Phase II differed from Phase I in that it was not concerned with applicants who were rejected nor with an investigation of high school rank and PNG performance.

MMPI and Rotter ISB

In Phase I no significant differences were found between achievers and underachievers, underachievers and failures, or achievers and failures in MMPI performance. In Phase II these results were confirmed. No inter-school MMPI differences were obtained. Personality or adjustment as assessed with the Rotter ISB was found to be unrelated to success in nursing education. Similar findings had been obtained in Phase I. Inter-school differences were again suggested with Luther applicants scoring higher than those of the two other schools to a degree that approached statistical significance. In Phase I, the Luther applicants had scored significantly lower than Holy Family. While difficult to explain, these findings point up the need to develop prediction systems for individual schools.

At the end of Phase I, the researchers concluded that the MMPI and ISB, tests designed for other purposes, could not be extended to the prediction of success in nursing education in any simple and straightforward fashion (Thurston and Brunclik, 1965). It was also concluded that the use of these tests for counseling students would probably require a psychologist who was prepared to test and defend the validity of his judgments. The sentence completions to the Rotter ISB might be of some value to nursing school faculty members who have sufficient background in psychology to exercise caution in their interpretations. The results of Phase II are interpreted as supporting these statements.

Luther Hospital Sentence Completions (LHSC)

The LHSC was constructed specifically for the purpose of evaluating the attitudes and emotional reactions of nursing school applicants and students. The Nursing Education Scale (NES) was developed to provide for quantified scoring of this test as an aid to predicting success in nursing education. At the end of Phase I the researchers concluded that the obtained differentiations between achievement levels were great enough for screening purposes or for the identification of those applicants most likely to fail (Thurston and Brunclik, 1965, p. 207). Additional cross-validations at Luther and Holy Family as well as at other schools were recommended at that time before utilizing the NES scores of the LHSC for the purposes indicated.

The relationship of LHSC performance to achievement status is significant and substantial for the schools (Luther, Holy Family) which served in the NES derivation. Both achievers and underachievers scored lower than the failures. In addition, the relationship of attitude area scores to achievement strongly supported the use of the LHSC in identifying specific areas of psychological strength and weakness in a student as they might pertain to success in nursing education. The strength of the relationship was such that operational, predictive use of the LHSC could be recommended at these schools.

The results at Madison General indicate both the potential of the LHSC as well as the need for caution in its usage. While a relationship was established between LHSC performance and achievement in this school, it was not as strong as that noted at the other schools. Both NES Total Score and Home-Family area scores were associated with achievement but probably not to a degree that would produce satisfactory prediction of the achievement status of students. Other schools interested in using this test for prediction and/or screening should proceed cautiously.

The Phase II results indicate that the following cautions from the Phase I summary should be kept in mind by any potential users: "It seems extremely unlikely that the problems of underachievement and failure-withdrawal will be understood fully if they are considered independent of the schools in which they occur. The psychological instruments used for the prediction of success in nursing education might have to undergo 'corrections' or even 'custom-making' for the specific schools or types of schools in which they are to be used" (Thurston and Brunclik, 1965, pp. 208-209).

The LHSC can be operationally useful to nursing schools if used qualitatively as a source of information to generate hypotheses regarding students. In addition, while the results do not clearly justify a recommendation for the general use of the NES scored LHSC's, a relationship between these scores and nursing achievement has been demonstrated. Cautious and judicious use of NES scoring of the LHSC could be helpful to nursing schools.

Summary

The principal findings of Phase II of this research into the relationship of personality to nursing school achievement are as follows:

1. At two schools, Holy Family Hospital School of Nursing and Luther Hospital School of Nursing, significant differences were found between the achievement levels for NES-LHSC total and five attitudinal area scores (Self, Home-Family, Responsibility, Others-Love-Marriage, and Academic). At one school, Madison General Hospital School of Nursing, significant differences

between the achievement groups were found on NES-LHSC Total Score and the Home-Family area score.

2. There were no significant differences in MMPI performance between achievers and underachievers, achievers and failures, or underachievers and failures. There were no significant inter-school MMPI differences. Similar resuls had been found in Phase I.

3. No significant differences were found between the achievement groups in Rotter ISB performance. Although differences approaching significance between schools were again revealed in terms of Rotter ISB scores, the differences were in a direction opposite from that reported in Phase I of this research.

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Table 1.1

MEANS AND STANDARD DEVIATIONS FOR TOTAL NES-LHSC SCORES FOR 445 SECOND YEAR NURSING STUDENTS AT THREE SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	Achiever	Under-achiever	Failure	
Luther Hospital	N = 50 M = 73.46 S.D. = 2.90	N = 17 M = 74.59 S.D. = 4.21	N = 43 M = 77.88 S.D. = 3.33	N = 110 M = 75.36 S.D. = 3.86
Holy Family Hospital	N = 56 M = 74.68 S.D. = 3.06	N = 17 M = 75.18 S.D. = 3.07	N = 15 M = 77.00 S.D. = 2.00	N = 88 M = 75.17 S.D. = 3.01
Madison General Hospital	N = 113 M = 74.07 S.D. = 3.45	N = 45 M = 75.16 S.D. = 2.98	N = 89 M = 75.22 S.D. = 3.57	N = 247 M = 74.68 S.D. = 3.45
				Total
Achievement Status Means	N = 219 M = 74.09 S.D. = 3.25	N = 79 M = 75.04 S.D. = 3.26	N = 147 M = 76.18 S.D. = 3.57	N = 445 M = 74.90 S.D. = 3.40

Table 1.2

ANALYSIS OF VARIANCE FOR PRE-ADMISSION TOTAL NES-LHSC SCORES AT LUTHER HOSPITAL AND HOLY FAMILY HOSPITAL SCHOOLS OF NURSING

Source	df	SS	MS	F
Nursing School	1	11.14	11.14	1.14
Achievement Status	2	407.38	203.69	20.76**
Achievement Status x Nursing School	2	34.56	17.28	1.76
Within Cell	192	1883.67	9.81	
Total	197	2336.75		

ANALYSIS OF VARIANCE FOR PRE-ADMISSION TOTAL NES-LHSC SCORES AT MADISON GENERAL HOSPITAL SCHOOL OF NURSING

Source	df	SS	MS	F
Achievement Status	2	78.52	39.26	3.37*
Within Cell	224	2842.86	11.65	
Total	246	2921.38		

* Significant at the .05 level

** Significant at the .01 level

Chapter 2

Research Design, Phase III

Phase III of this research was planned as a four year program. The design will be described fully. However, inasmuch as research support was forthcoming for only one year, many of the Specific Aims cannot be accomplished fully at this time. This research report will describe partial accomplishment of Specific Aims 1-a, 2-a, 3-a, and 5. As much data as possible will be presented which bear upon the realization of Specific Aims 1-b and 2-b. All of the research scheduled for 1967 has been completed. It is hoped that many of the other Specific Aims can be accomplished in subsequent research.

PREDICTION OF SUCCESS IN NURSING EDUCATION - PHASE III
(1967 - 1970)

I. Research Plan
  A. Specific Aims
    1. To evaluate the efficiency of the NSC, NAI and LHSC for the prediction of success or failure early in the nursing school experience of students. To accomplish this, there must be continual validation of the three tests as scored by the Nursing Education Scale (NES):
      a. Nursing Sentence Completions (NSC)
      b. Nurse Attitudes Inventory (NAI), Forms I and II
      c. Luther Hospital Sentence Completions (LHSC)
    2. To develop attitudinal area scores for the three tests:
      a. Nursing Sentence Completions (NSC)
      b. Nurse Attitudes Inventory (NAI), Forms I and II
      c. Luther Hospital Sentence Completions (LHSC)

      For each of these tests, scores would describe the individual student's test performance in terms of similarity to successful or unsuccessful student performance in the following six attitudinal areas: 1) Nursing, 2) Self, 3) Others-Love-Marriage, 4) Home and Family, 5) Responsibility, and 6) Academic.

      An attempt will be made to construct individual test profiles using the six area scores to describe the unique patterning of a student's attitudes as they relate to nursing education.
    3. To provide the differences among nursing schools through the development of local scoring standards. This would involve the development of local Nursing Education Scales (NES) for each participating school if differences among schools are found. To accomplish this there would be:

a. An evaluation of the NES total and area scores for the NSC, NAI and LHSC <ins>at each school</ins> in addition to the overall evaluation of Specific Aim I.

b. The derivation of Empirical NAI scores for <ins>each school</ins> of nursing. These special scores would be based upon the responses which were found to differentiate successful and unsuccessful students at each school.

c. The cross-validation of the Empirical NAI scores mentioned immediately above. This would provide information regarding the validity of these NAI-NES scores in predicting successful and unsuccessful student performance <ins>at each school</ins>.

4. To develop a General Empirical NAI key based on results of the local validation for Aim 3.

   The results of the cross-validation of 3 above will be pooled for an overall analysis of the 350 choices (70 items, 5 options each) of the NAI, Form I. This will be an analysis of the power of options to discriminate between graduates and non-graduates at several or all of the schools. These results would provide the basis for a General Empirical NAI key. Qualitative analysis of the nature of choices capable of these differentiations could provide additional insights into psychological factors associated with graduation or failure to graduate.

5. To proceed in the development of the Empathy Inventory which is to be used with nursing school faculty and counselors. This inventory was conceived of as a research tool to explore the role of individual faculty members and/or schools in precipitating underachievement, withdrawal, and failure of nursing students. Final development of the Empathy Inventory would include determination of test-retest reliability and an exploration of the means by which the validity of these scores could be investigated in relation to the prediction of instructor performance.

6. To test the generality of the results and to promote the use of the psychological tests. Throughout Phase III of this investigation there will be concerted effort to extend the results of the previous and ongoing investigation to other schools of nursing and to verify the extent to which the finding and interpretations are applicable to other institutions in different locations and with differing types of educational programs.

7. A seventh aim of Phase III, not included in the original application, but facilitated by ready availability of data, was stated as follows: To test the predictive efficiency of a battery of ability, personality, attitudinal and biographical measures using multiple correlation and discriminant function techniques. The achievement indices to be predicted were semester grade averages and grades in specific nursing education courses. It was planned that these analyses with familiar and established predictors of achievement would serve as a base prediction

system. Tests could then be made of NSC and NAI power to add significantly to a basic prediction system. The five Purdue Nursing Education programs (Lafayette, Indianapolis, Hammond, Fort Wayne, and Michigan City) served as centers for this research.

B. Method of Procedure

1. Participating Schools of Nursing

a. Established participants:

1) Holy Family Hospital School of Nursing, Manitowoc, Wisconsin
2) Madison General Hospital School of Nursing, Madison, Wisconsin
3) Luther Hospital School of Nursing, Eau Claire, Wisconsin
4) Henry W. Bishop Memorial School of Nursing, Pittsfield, Massachusetts
5) Lutheran Hospital School of Nursing, Cleveland, Ohio
6) Regina School of Nursing, Albuquerque, New Mexico
7) Mercy Hospital School of Nursing, New Orleans, Louisiana
8) Jackson Memorial School of Nursing, Miami, Florida
9) Emanuel School of Nursing, Portland, Oregon
10) Nursing Sections, Purdue University, Lafayette, Indianapolis, Hammond, Fort Wayne, and Michigan City, Indiana. (associate degree program)

Henry W. Bishop School of Nursing, Pittsfield, Massachusetts and Regina School of Nursing, Albuquerque, New Mexico will remain as participants until the time of their closing in 1968; Luther Hospital School of Nursing, Eau Claire, Wisconsin will continue to participate until the graduation of its last class in 1967.

b. New participants (1966)

1) Nebraska Methodist Hospital School of Nursing, Omaha, Nebraska
2) California Hospital School of Nursing, Los Angeles, California
3) Bryn Mawr School of Nursing, Bryn Mawr, Pennsylvania
4) St. Vincent's Hospital School of Nursing, New York, New York
5) St. Joseph's Hospital School of Nursing, Marshfield, Wisconsin

All of the above schools have agreed to test newly-admitted students and to indicate whether or not they have completed their program at the time their class is scheduled to graduate.

2. Tests

a. Luther Hospital Sentence Completions (LHSC)
b. Nursing Sentence Completions (NSC)
c. Nurse Attitudes Inventory (NAI), Form I
Nurse Attitudes Inventory (NAI), Form II
d. Tests used in the study of multiple prediction at Purdue's five centers are listed in Chapter 6.

3. Nursing Education Scale (NES)

In view of the emphasis in this research upon validation of the LHSC, NSC and the two forms of the NAI as scored by the NES, it appears appropriate to provide a brief resume of NES development (Thurston and Brunclik, 1965). The 1959 pre-admission LHSC forms of three groups (achievers, underachievers, and failure-withdrawal) at two schools were studied sentence stem by sentence stem for all ninety stems of the LHSC. Scoring values were assigned on the basis of their demonstrated ability to discriminate among the criterion groups. A score of three was assigned to those completions which tended to be characteristic of failure-withdrawal students. A score of one was given those completions characteristic of the achiever group. Scores of two were assigned to those responses not particularly associated with any of the criterion groups. Fifty-nine stems appeared to be acceptable discriminators. These constituted the NES, Preliminary Form. The individual student's NES score was determined by adding the scores given to the responses to each of the ninety LHSC sentence stems. The NES, Preliminary Form, was then applied to the 1960 and 1961 pre-admission LHSC's of students evaluated in 1962 and 1963 as a cross-validation. This preliminary form underwent extensive modifications on the basis of this testing. The forty remaining stems and the differentiating and scoreable responses became the Nursing Education Scale (NES).

4. Evaluation

   The evaluation required at the very least, an accounting of which students graduated and which students failed to graduate. These categories, based on student status at the time of the graduation of her class three years after admission will define the basic criterion groups of the study, graduate versus non-graduate. (The two year Associate Degree program at Purdue will be the exception to this). Further, more refined evaluations of the category of non-graduation were to be o obtained from the schools. For example, this refinement might result in sub-categories of failure students on the basis of cause such as failure for academic reasons, personal reasons, etc.

5. Validation of the NSC, NAI, and LHSC as scored by the NES.
   a. Validity of Nursing Sentence Completions (NSC) as scored by the Nursing Education Scale (NES).

      The Nursing Sentence Completions (NSC) have been administered to entering students as part of the routine admission procedures in five schools of nursing each year since 1964 (Luther testing ceased in 1964) and in three additional schools since Fall, 1965. As indicated in the Evaluations section (4), 1967 graduation or non-graduation of those students tested with the NSC in 1964 will provide a basis for assessing the validity of the NES in terms of NSC performance. When the 1965 NSC testing at the eight schools of nursing is related to graduation status (graduated or failed to graduate) in 1968, Specific Aim 1a will be accomplished.
   b. Validity of Nursing Attitudes Inventory (NAI) as scored by the Nursing Education Scale (NES).

The Nurse Attitudes Inventory (NAI) Form I has been administered to entering students as part of the routine admission procedure in eight schools of nursing in Fall of 1965. This procedure will be repeated on an annual basis in six schools. (Albuquerque, New Mexico and Pittsfield, Massachusetts are no longer admitting students.)

The relationship of 1965 NAI performance to 1968 graduation status will provide a basis for assessing the validity of the NES in terms of NAI, Form I, performance. When the 1966 NAI, Form I, testing at the six schools of nursing is related to graduation versus non-graduation in 1969, Specific Aim 1b will be accomplished.

Nurse Attitudes Inventory (NAI) Form II will be administered routinely along with the LHSC at the five new participant schools on an annual basis beginning in Fall, 1966, the beginning of their participation in the research program. The relationship of NAI, Form II performance to graduation status in 1969 and 1970 will afford additional evidence bearing upon Specific Aim 1b.

c. Validity of Luther Hospital Sentence Completions (LHSC) as scored by the Nursing Education Scale (NES).
The validity of the pre-admission LHSC performance as scored by NES has been under investigation since 1964. The evidence suggests that significant relationships between pre-admission LHSC performance and achievement in nursing school exists (Thurston and Brunclik, 1965). This Phase III research will investigate the validity of the LHSC as scored by the NES when the LHSC is administered after a student enters a nursing program. Thus, a more thorough evaluation of the LHSC's predictive validity will be accomplished. The LHSC's will be administered routinely to all entering freshmen at five schools of nursing beginning in Fall, 1966. The validity of the LHSC administered under these circumstances will be evaluated in 1969 at the time of the class' graduation. In view of the previous work involving the LHSC, this validation will complete Specific Aim 1c.

6. Attitudinal areas deriving from NES scoring of Nursing Sentence Completions (NSC), Nurse Attitudes Inventory (NA), and Luther Hospital Sentence Completions (LHSC).
The six NES attitudinal areas will be established through logical analysis of scale items and their validities assessed under the same time table and in the same manner as the NES total scores for the three tests (See 5a, 5b, and 5c above). When these results have been gathered, analyzed and interpreted, Specific Aim 2a, Specific Aim 2b, Specific Aim 2c will be completed.

7. The need to devote attention to differences among nursing schools.
The investigation of the NSC, NAI and LHSC as scored by the NES (See 5a, 5b, and 5c above) represents an effort to establish the

application of these tests to nursing students generally. This aspect of the research will require, in addition, similar analyses for each and every one of the participating schools. This will be done at the same time as the analysis involving Specific Aim I. When completed, Specific Aim 3a will have been accomplished.

8. After the criterion groups, graduates versus non-graduates, have been established for the analysis to satisfy Specific Aim 3a, the NAI's (Form I) of each school will be subjected to an item analysis. In this analysis the 350 choices (5 choices x 70 items) will then be analyzed one at a time in order to determine whether or not they were answered differentially by the graduates and non-graduates. If the difference between these groups in response for a choice is significant at the .10 level of confidence, it will be included in the Empirical NAI scoring key for that school. With a special Empirical scoring key developed for each school, Specific Aim 3b will be accomplished.
9. After the development of the Empirical NAI scoring keys at individual schools (1968), the NAI's of the students admitted in 1966 at each of these schools will be scored in accordance with these keys. The efficiency of the Empirical NAI key in differentiating between graduates and non-graduates of this new group at each school will be the measure of its validity. Specific Aim 3c will then be accomplished.
10. General Empirical Scores.
    All of the test responses used in the development of Empirical NAI scoring keys for each school will be pooled for an overall analysis of the value of each option in discriminating between graduates and non-graduates. This analysis will then be of the same nature as that described under 8 above. This will allow for satisfaction of Specific Aim 4.
11. The Empathy Inventory was developed in 1966 (Brunclik, Thurston, and Feldhusen, 1967). Norms for this inventory were established in 1966 with the assistance of faculties of thirty-five nursing schools. Test-retest reliability will be determined in 1967. Complete exploration of the implications and possible applications of the Empathy Inventory scores will be undertaken in 1967. This will allow for completion of Specific Aim 5.
12. Assessment of the generality and utility of research findings will continue throughout Phase III. These efforts will include a comparison of the Empirical NAI scoring keys developed at the individual schools to determine the discriminating responses which are unique to particular schools and those which are general for several or all schools. Publication of the findings emerging from these investigations and all those related to other specific aims will be undertaken. When these assessments and publications have been completed, Specific Aim 6 will be accomplished.

C. Significance of this research

The problem of high rate of withdrawal from nursing education programs has been present as long as there have been schools of nursing. In an effort to cope with this problem, the methods of selection have received considerable attention over the years. Substantial improvements have been noted. Requirements relating to high school achievement and aptitude as set by the different schools are becoming more and more uniform. Nevertheless, a considerable problem of withdrawal and underachievement persists. In 1955, there were 46, 498 students admitted to schools in the United States and its possessions. Only 28, 729 of these graduated. The picture has not changed appreciably since that time. This withdrawal rate of over one-third together with the fact that many students do not work up to capacity has tremendous implications. Any student who is admitted to a school of nursing and who fails to complete her course represente a considerable loss of effort, money, and material resources to the school and to the individual student.

The problem appears to a great extent to be the proper selection of students. If schools of nursing had information on students which they could use to predict success in their program, they would be able to refuse admission to the least desirable candidates, guide the mediocre students, and admit without reservation those most likely to succeed.

Many studies involving prediction of general academic success in schools and colleges have been made. The great majority of these have been concerned with combinations of factors found to be important determinants of this form of success, such as academic aptitude, previous class average, etc. (See Chapter 6). Forecasting success or failure in schools of nursing is even more complicated than the problem in colleges, because it involves the prediction of satisfactory performance not only in the classroom setting but also in the clinical situation.

The statement of Bennett and Gordon in 1944 relating personality test scores and success in the field of nursing continues to hold true today: "Tested against a rating scale of the degree to which the personality of an individual contributed to success in training, the personality tests used demonstrated an almost negligible power of prediction." Voss (1956) has stated that, "In general, the findings relating to underachievement and overachievement are inconsistent. This suggests that the characteristics of underachievers and overachievers are difficult to identify. The conclusions reached by one investigator have, at times, been almost diametrically opposed to those reached by another." A current review of the literature strongly suggests that a similar statement might be made concerning the use of most personality tests as predictors of which students will withdraw or underachieve. Taylor (1963) after an extensive review of research in nursing education, cited our research, entitled "The Prediction of Success in Nursing Education" as one of the few involving personality and nursing education which held promise of producing meaningful results.

In viewing the problem and its accompanying methodological difficulties, it would seem that two things stand out clearly. On the one hand, there are the traditional personality tests (MMPI, Bernreuter, Kuder, etc.) which are highly reliable in terms of scoring and re-testing, but have little in the form of demonstrated validity and utility. On the other hand, the projective tests (Rorschach, TAT, Draw-A-Person, etc.) are just beginning to be investigated. In Nursing Research (1954), Marie Farrell stated that, "research is needed to develop projective techniques which may be useful in screening potential students who may be unsuited to the stresses of nursing; these same techniques also might be valid methods to use in counseling both undergraduate and graduate nurses." Mindess (1957) has found that the Wechsler-Bellevue Intelligence Scale and the Rorschach in the hands of a competent clinician give results that are significantly related to achievement in nursing education. This gives support to the idea that projective tests may have value in making the predictions under consideration. This approach is not without obstacles. Projective tests are often difficult to score and the results may tend to be somewhat unreliable. Another difficulty concerns the need for an exhaustive, time-consuming administration and interpretation by highly skilled clinical psychologists. Accordingly, even if the effectiveness of the customary projective techniques were demonstrated, only a few schools would have the requisite personnel for using these tests on a routine basis.

It seemed advisable for some of the above reasons, to utilize a technique that has many of the favorable elements of both the questionnaire and the projective techniques. The sentence completion form seemed to be such an instrument. "Sentence completion form" as a term refers to a type of test in which the person is requested to respond, in a meaningful manner, to incomplete sentences presented as stimuli. The expressed attitudes and emotional reactions have been found to indicate important personality characteristics of the person tested. Accordingly, the development and validation of a sentence completion form, the Luther Hospital Sentence Completions (LHSC), constituted an area of primary emphasis in the early phases of this research project.

On the basis of findings to date, it would appear that "The Prediction of Success in Nursing Education" (NU 00018) has begun to fulfill the promise suggested by Taylor (1963). A relationship has been demonstrated between sentence completion performance and eventual success in nursing education. These findings have been reported in detail in The Prediction of Success in Nursing Education, Phase I, 1959-64 (Thurston and Brunclik, 1965a). The sentence stems capable of differentiating achievers, underachievers, and failure-withdrawals prior to admission have been identified. These stems together with the significant completions and scoring weights constitute the Nursing Education Scale (NES). The Nursing Sentence Completions (NSC) has also been constructed.

It is felt that the fundamental significance of the longitudinal research lies in four areas which are logical extensions of the previous research:

1) One of these involved the continued refinement, validation, and

extension of a testing technique and scoring method which has already begun to demonstrate some validity in the *early detection* of students who may fail, withdraw or underachieve.

2) The second of these involves the continued development of procedures based upon the Nursing Education Scale (NES), which will allow schools of nursing to make *practical use* of these psychological test results in working with their students. The Nursing Sentence Completions (NSC) and Nurse Attitudes Inventory (NAI) based upon the Luther Hospital Sentence Completions (LHSC) and Nursing Education Scale scoring have been introduced specifically with this in mind. In the case of the NAI, it is hypothesized that the underlying predispositions toward achievement, underachievement, or failure may become manifest in the completions *selected* by the students as well as those which the students *give* in response to the NSC or the LHSC. Ease of administration and simple, highly reliable scoring and interpretations are some of the advantages of this form. If these revisions demonstrate validity, comparable to that achieved with the LHSC as scored by the NES, these advantages should make them particularly valuable to schools of nursing which are always hard pressed for time and which usually do not have clinical psychologists available to assist them in their interpretations.

3) The third significant aspect of the proposed research involves area scoring. The scoring according to *attitudinal areas* was undertaken to provide nursing counselors with additional meaningful information involving potential areas of difficulty for students. With such scoring, it will be possible to compare each individual student's performance with others in regard to attitude toward: 1) Nursing, 2) Self, 3) Others-Love-Marriage, 4) Home and Family, 5) Responsibility, and 6) Academic studies. If specific problems or problem areas could be identified on the basis of LHSC, NSC or NAI performance, counseling efforts might be concentrated upon them most efficiently before they emerge full blown and result in underachievement and withdrawal. Knowledge of the likelihood of a student's success in nursing education together with data regarding specific sources of her psychological strengths and weaknesses regarding nursing education should thus be of practical use to nursing school faculties.

4) The fourth significant aspect of the proposed research centers upon the Empathy Inventory. This test, developed on the basis of research leading to the Nurse Attitudes Inventory, provides a means of assessing individual differences among faculty members in the ability to know what students consider to be preferred responses in the area of attitudes and emotional reactions. The final development and standardization of the Empathy Inventory would provide an instrument which could be helpful in investigating the part that individual faculty members play in the problem of student underachievement and failure. Efforts will be made to encourage such research.

With the development of devices of practical utility, such as these suggested above, the following highly desirable results might be obtained:

1. More effective selection procedures with a resulting higher caliber of the student body.
2. Better recognition of the guidance needs of the students and more effective counseling.
3. Fewer students subjected to the psychological trauma of failure in school or in State Board Examination.
4. Financial savings for nursing schools.
5. More nurses completing their programs successfully with an ultimate increase in the number of nurses employed.
6. Better nursing care for the patients because the resulting increase in the quality of nurses will lead to more efficient, comprehensive nursing practices.

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Chapter 3

Nursing Sentence Completions (NSC)

The Nursing Sentence Completions (NSC) is an abbreviated form of the Luther Hospital Sentence Completions (Thurston and Brunclik, 1959). The forty stems that comprise the NSC (Thurston and Brunclik, 1964) are those from the LHSC which were found to be significant discriminators among achievement groups (Thurston and Brunclik, 1965).

NURSING SENTENCE COMPLETIONS

Copyright 1964 by Thurston - Brunclik

Name: ______________________________ Date: ______________

Below are a number of incomplete sentences. By completing these sentences you can express how you feel about many things. Try to do every one. Feel free to write whatever you wish.

1. When I go to nursing school, my family
2. In high school, I was happiest when
3. At home, I
4. Teachers
5. I feel sad if
6. When on a date, I
7. I like to help when
8. I'm different from other girls in that
9. My family
10. When someone tells me to do something
11. When with strangers, I
12. Supervised study periods
13. I pray
14. Ten years from now, I
15. Most people think that a nurse
16. Other people think of me as
17. I feel disgusted with myself when
18. When asked to take charge, I
19. The trouble with other people
20. If I could change
21. When I think of myself as a nurse, I
22. My mother thinks that I
23. I hope I never
24. When they ask for volunteers
25. I plan to marry when

26. If not admitted to nursing, I'll
27. In making a decision, I
28. Other girls my age
29. When I need money
30. I have most confidence in
31. When criticized, I
32. My most disappointing experience in high school
33. I worry
34. My greatest asset
35. Bathing someone is
36. The most important person
37. In school, I
38. When afraid, I
39. In high school my assignments
40. The first time away from home, I

Qualitative Use of NSC

It should be pointed out at the very outset that the researchers believe in the absolute necessity of adopting an enlightened, cautious approach to the use of all psychological tests, forms, or inventories. Stress should be placed upon the assertion that psychological data does not, in itself, tell what is wrong or right with an individual, or what should be done for or with her. Criticisms of the field of psychological testing (Gross, 1962 and Hoffman, 1962) often carry the implication that the treatment, selection, placement, or promotion of an individual is totally dependent upon test results. It is even suggested in these writings that some people believe that the test will tell all that is necessary to know. In contrast, it should be emphasized that test data should always be viewed as adjunct or supplementary information. The test findings should be set against background information of the individual. Both should be supplemented with observations of current behavior of the individual under study. Then it is possible to formulate tentative hypotheses or ideas concerning the student's behavior and out of this evolves a plan for constructive action. The hypotheses and the plans are products of decision-making processes by one or more people. The effectiveness of planning is therefore to a large extent dependent upon the wisdom and psychological sophistication of the individuals making the plans. Human beings, not tests, make these decisions. If this statement and all of its ramifications are clearly understood, then psychological tests may make their maximum contribution. All of this imposes considerable responsibility upon the person using the materials. It is imperative that the counselor exercise extreme caution in his hypothesizing and interpreting. It is the position of the researchers that information obtained in the fashion of this study should never be used as a primary basis for any decisions regarding admission or retention of an individual in a nursing school program. The data should be used to identify or highlight areas of potential difficulty or strength so that these may be counteracted or emphasized in counseling and helping the student. In keeping with these considerations, the tests developed in this research are made available only to faculty members of nursing schools or to researchers in this field.

It is suggested further that there be no fixed, absolute rules for the analysis and interpretation of the Nursing Sentence Completions (NSC). A flexible approach is recommended. The completions can generally be accepted at their face value. At times, however, a student may react defensively and offer only evasive, stereotyped, or ingratiating responses. Guarded answers are often characteristic of a distrustful person who is afraid to show how she really feels. Advance knowledge regarding prospective students of this sort might be quite helpful to the faculty of a school of nursing.

Simple inspection of the NSC ordinarily reveals much useful information regarding the attitudes and emotional reactions of a student or a prospective student. The more thoroughly trained and experienced the interpreter becomes, however, the greater the yield of knowledge about the individual.

The completions to the NSC can provide the faculty members with general information that she might not be able to acquire easily in any other way. Indications of personal likes, dislikes, fears, strengths, weaknesses, and needs, are called forth from each applicant in a systematic fashion. To the faculty member, this might have value in planning lessons, individual classroom assignments, and student-counselor conferences. It could allow her to become alert to many factors of potential import to a student in a nursing school.

If the faculty member has neither the time nor the inclination to use the NSC for general information on all her counselees, it might be worthwhile to have it administered in order to have this information for use at some later date when the faculty member might be confronted with a specific problem that she would like to understand better.

If the problem of the student clearly exceeds the resources of the counselor, she might be referred to a psychologist or psychiatrist for psychological evaluation and recommendation. Here, too, the NSC could provide a psychological point of reference by which to measure personality changes over a period of time. In this regard, and by themselves, this data could constitute a basis for the development of insights and deeper interpretations by these trained specialists.

Nursing Education Scale - NSC

Inter-Scorer Reliability

Thirty-six NSC records of 1963 applicants to Regina School of Nursing, Albuquerque, New Mexico, were selected for evaluation of inter-scorer agreement in application of NES to the NSC. These records were scored by a clinical psychologist (A), a nurse (B) who has had considerable experience in scoring sentence completion forms, two nurses (C and D) who had no scoring experience, and a university student (E-1) who was majoring in psychology. This same student also re-scored the thirty-six NSC's (E-2). Evidence of high agreement between scores was noted with the highest agreements between B and E-1 (r = .80), B and A (r = .77), B and D (r = .79), and D and E-1 (R = .83). Of the five scorers, C, a nurse, seemed to be in least agreement with the others.

Test-Retest Reliability

NSC's were administered routinely to students at the Lafayette Campus of the Nursing Section, Purdue University, during the first two weeks of their program. In order to evaluate the stability of NSC performance as scored with the NES, NSC's were re-administered to this group after the routine administration of the NSC and Nurse Attitudes Inventory (NAI). Twelve days elapsed between test and re-test with the NSC. All tests were scored by the psychologist using the NES. Two NSC testings were available for 56 students. Correlations were then computed using these two sets of records for six NES-NSC Area Scores and NES Total Scores. All correlations with the exception of Nursing and Academic Area Scores are statistically significant at the .05 level.

Normative Standards

In the course of this research norms were established in percentile form for NES-NSC Total and Area Scores. These are presented in Appendix 1. These standards are based upon 686 NSC records acquired during testing in Fall, 1964 and 1965.

Results

Validation of Nursing Education Scale - NSC

Considerable discussion was undertaken regarding the most effective way to present the results of the cross-validation of the NES-NSC. It was decided to employ two basic criterion measures in the analysis.

1. For the students tested in 1964, the achievement measures were "graduation" or "non-graduation" by summer 1967 at six schools of nursing.
2. For the students tested in 1965, inasmuch as they were scheduled for graduation in 1968, the achievement categories were "in school" or "not in school" by summer 1967 at eight schools of nursing.

Secondary analyses involved refinements of the "non-graduation" and "no longer in class" components of these basic criteria. Each of these was divided into four categories based on the reason for failure to graduate or failure to remain in class: 1) personal reasons, 2) academic reasons, 3) delayed until subsequent class, and 4) transferred to another nursing program.

Analyses were conducted regarding the relation of seven NES-NSC scores (Nursing, Self, Home-Family, Responsibility, Others-Love-Marriage, Academic, and Total) to the basic criterion measures described above and to their refinements.

1. For students tested in 1964 and evaluated in 1967 at each of the six schools.
2. For students tested in 1964 and evaluated in 1967 at the six schools combined.

3. For students tested in 1965 and evaluated in 1967 at each of the eight schools.
4. For students tested in 1965 and evaluated in 1967 at the eight schools combined.

The results of this portion of the study as analyzed by analysis of variance (Scheffe', 1960) are presented in Tables 3.1 - 3.31. Results were considered significant when $P < .05$.

1964 Testing (6 schools of nursing) 1967 Criterion: Achievement Status (graduation vs. non-graduation)

The mean Nursing NES-NSC-Area Scores are shown in Table 3.1. Statistically significant F ratios were obtained for achievement status at Luther, Henry W. Bishop, and the six schools combined. In Table 3.2 the mean Self NES-NSC-Area Scores are given. Significant F ratios were produced for achievement status at Henry W. Bishop, Regina, and the six schools combined. The mean Home-Family NES-NSC-Area Scores are reported in Table 3.3. No significant F ratios were produced for achievement status at any of the individual nor for the combined schools.

The means of the Responsibility NES-NSC-Area Scores are given in Table 3.4. Significant F ratios for achievement status were obtained at Lutheran, Regina, and for the six schools combined. The mean Others-Love-Marriage NES-NSC-Area Scores are found in Table 3.5. Significant F ratios for achievement status were obtained for Luther and for the six schools combined.

The mean Academic NES-NSC-Area Scores are given in Table 3.6. No significant F ratios were produced for achievement status at any of the individual schools nor for the combined schools. The mean Total NES-NSC Scores are reported in Table 3.7. Significant F ratios for achievement status were obtained for Luther, Henry W. Bishop, Lutheran, Regina, and for the six schools combined. Tables 3.8 - 3.13 contain the analyses of variance for achievement status at Luther, Holy Family, Madison General, Henry W. Bishop, Lutheran and Regina respectively. Table 3.14 presents the analysis of variance for school and achievement status for all six of these schools combined.

Additional analyses were conducted using "graduation" and the reasons for not having graduated, or "in school" and the reasons for not being in school as the criteria. In order to conserve space the means, s.d.'s, mean differences, and analyses of variance are not included in this report. There were no consistent NES differences among these scores for the categories indicating different reasons for not graduating or not remaining with their class.

Table 3.15 is a summary of the NES-NSC-Area and Total Scores (1964) which differentiate (.05 level or greater) graduates from non-graduates (1967) at the six schools of nursing. Table 3.16 shows the distribution of NES-NSC Total Scores by achievement status at these six schools.

1965 Testing (8 schools of nursing) 1967 Criterion: Achievement Status ("In school" or "Not in school")

The mean Nursing NES-NSC-Area Scores are shown in Table 3.17. Statistically significant F ratios were obtained for achievement status at Holy Family, Madison General, and for the eight schools combined. In Table 3.18 mean Self NES-NSC-Area Scores are given. No significant F ratios for achievement status were noted. The mean Home-Family NES-NSC-Area Scores are reported in Table 3.19. Significant F ratios were obtained for Regina, Emanuel and for the eight schools combined.

The means of the Responsibility NES-NSC-Area Scores are given in Table 3.20. Significant F ratios were obtained for achievement status at Henry W. Bishop, Lutheran, Jackson, and for eight schools combined. The mean Other-Love-Marriage NES-NSC-Area Scores are found in Table 3.21. Significant F ratios were obtained for achievement status at Jackson, Mercy, and for eight schools combined. The mean Academic NES-NSC-Area Scores are given in Table 3.22. A significant F ratio was noted only at Jackson. The mean Total NES-NSC Scores are reported in Table 3.23. Significant F ratios were obtained at Henry W. Bishop, Jackson, and for the eight schools combined.

Tables 3.24 - 3.31 contain the analyses of variance for achievement status at Holy Family, Madison General, Henry W. Bishop, Lutheran, Regina, Jackson, Mercy, and Emanuel Schools of Nursing respectively. Table 3.32 presents the analysis of variance for school and achievement status for all six schools combined.

Table 3.32 is a summary of the NES-NSC Area and Total Scores (1965) which differentiate (.05 level or greater) those students still in school from those students no longer in school (1967). Table 3.34 gives the distribution of NES-NSC Total Scores by achievement status at the eight schools of nursing.

Discussion

The NSC is comprised of those LHSC sentence stems which elicited responses differentiating achievement levels in nursing education (See Chapter 1). The Nursing Education Scale (NES) was developed to provide for quantified scoring of the LHSC and the NSC as a means of predicting success in schools of nursing. The relationship of NES-LHSC Scores to achievement status has been found to be significant and substantial for the schools (Luther, Holy Family) which served in the NES derivation (Thurston, Brunclik and Feldhusen, In press). At that time it was determined that the relationship of the attitude area scores to achievement strongly supported the use of the LHSC in identifying specific areas of psychological strength and weaknesses in a student as they might pertain to success in nursing education. The strength of this relationship was such that operational, predictive use of the LHSC could be recommended at those schools. The results at Madison General indicated both the potential of the LHSC as well as the need for caution in its use. While a relationship was established between LHSC performance in this school, it was not as strong as that noted at the other schools. In view of the inter-school differences noted in previous research (Thurston and Brunclik, 1965), it was suggested that the psychological instruments used for prediction of success in nursing education might have to undergo "corrections" or even "custom-making" for the specific schools or types of schools in which they were to be used.

Phase III was addressed in part to determining to what extent the judgments regarding the LHSC would hold true for the NSC and in part to a further study of inter-school differences in NES effectiveness. A significant relationship between achievement status and NES-NSC Total Scores was demonstrated when all schools were considered together. However, significant relationships involving NES-NSC Total Score order were shown at only two of the schools when they were considered individually. Similarly it was noted that significant relationships were reported for four of the six area scores (Nursing, Self, Responsibility, and Other-Love-Marriage) when considering all schools combined. Again these relationships were not noted with consistency when evaluated at different schools nor from year to year at the same school.

Attempts were made to assess the ability of NES-NSC scores to discriminate the students who failed to graduate or remain with their class for academic, personal, or other reasons. This was done in the face of the acknowledged difficulty or establishing with exactitude the reasons for these failures to finish as originally scheduled. No consistent NES-NSC differentiations emerged among the categories.

It may be concluded that the NSC like the LHSC elicits responses that are generally related to success or failure in nursing education. It would appear however, that there is considerable variation in the magnitude of this relationship from one school to another, and to a lesser degree within one school from time to time. The reasons for this variation might be ascertained through future research. Differences in the psychosocial climate of nursing schools would seem to be one potentially profitable area of exploration in this regard. The individual differences in emphatic ability among faculty members probably affect interactions among instructors and this could have impact upon the psychosocial climate (See Chapter 5). Significant changes in the status or leadership of the school, such as the possibility that it might lose accreditation and/or close, or a change of director, might constitute other influences which might interfere with or obscure the relationship of LHSC or NSC performance to student success.

Individual schools in research involving NES-NSC scoring might also discover which of the attitudinal areas predict well with their programs and which ones do not, e. g. "proper" attitudes regarding academic matters may be highly related to success at one school and much less so at another. Aside from the potential significance of such findings in the counseling of individual students, this information might provide the bases for modifications in overall school philosophy and policy. The potential predictive use of these scores in combination with measures of intelligence and achievement by means of "discriminant function" has been detailed elsewhere (See Chapter 6). Utilization of this statistical technique allows specific predictions of student success or failure.

Schools interested in using NES-NSC Scores for screening-admission purposes should proceed with utmost caution in this regard. Research should be undertaken to ascertain the predictive effectiveness of these scores at the individual schools contemplating their use for this purpose.

Schools would be advised to employ with discretion their use of NES-NSC scores per se to identify the students most likely to experience personal difficulty in nursing school. All things considered, however, it would appear justifiable to use NES-NSC scores as a tentative guide for such identification. These scores could be used in connection with a qualitative analysis of individual NES responses to provide a basis for intervention and attempts at the alleviation and remediation of her problems. This approach, as described earlier in this chapter, would have particular value to a nursing school having only a limited amount of professional counseling or faculty counseling time available.

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Table 3.1

MEAN NURSING NES-NSC-AREA SCORES (1964)
BY ACHIEVEMENT STATUS (1967)
FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			Schools Means
	Graduate -	Non-graduate =	Difference	
Luther Hospital	N = 24	N = 31		N = 55
Eau Claire, Wis.	M = 8.67	M = 9.35	M = -.68**	M = 9.05
	S.D. = .87	S.D. = .88		
Holy Family	N = 29	N = 4		N = 33
Hospital	M = 8.86	M = 9.00	M = -.14	M = 8.88
Manitowoc, Wis.	S.D. = .95	S.D. = .82		
Madison General	N = 12	N = 16		N = 28
Hospital	M = 8.83	M = 9.31	M = -.48	M = 9.11
Madison, Wis.	S.D. = .94	S.D. = 1.08		
Henry W. Bishop	N = 20	N = 14		N = 34
Pittsfield, Mass.	M = 8.50	M = 9.21	M = -.71*	M = 8.79
	S.D. = .83	S.D. = .70		
Lutheran Hospital	N = 31	N = 5		N = 36
Cleveland, Ohio	M = 8.65	M = 9.20	M = -.55	M = 8.72
	S.D. = 1.05	S.D. = 1.10		
Regina School	N = 10	N = 28		N = 38
Albuquerque,	M = 8.90	M = 9.39	M = -.49	M = 9.26
New Mexico	S.D. = 1.20	S.D. = 1.20		
Combined School				
Achievement	N = 126	N = 98		N = 224
Status Means	M = 8.72	M = 9.31	M = -.59**	M = 8.98

* Significant at .05 level
** Significant at .01 level

Table 3.2

MEAN SELF NES-NSC-AREA SCORES (1964) BY ACHIEVEMENT STATUS (1967) FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	Graduate -	Non-graduate =	Difference	
Luther Hospital	N = 24	N = 31		N = 55
Eau Claire, Wis.	M = 22.88	M = 23.06	M = -.18	M = 22.98
	S.D. = 1.48	S.D. = 1.03		
Holy Family	N = 29	N = 4		N = 33
Hospital	M = 23.31	M = 22.75	M = +.56	M = 23.24
Manitowoc, Wis.	S.D. = .97	S.D. = 2.06		
Madison General	N = 12	N = 16		N = 28
Hospital	M = 22.75	M = 22.69	M = +.06	M = 22.71
Madison, Wis.	S.D. = 1.29	S.D. = 1.14		
Henry W. Bishop	N = 20	N = 14		N = 34
Pittsfield, Mass.	M = 22.20	M = 23.29	M = -1.09*	M = 22.65
	S.D. = 1.47	S.D. = 1.33		
Lutheran Hospital	N = 31	N = 5		N = 36
Cleveland, Ohio	M = 23.22	M = 24.00	M = -.78	M = 23.33
	S.D. = 1.61	S.D. = 1.87		
Regina School	N = 10	N = 28		N = 38
Albuquerque,	M = 22.40	M = 23.39	M = -.99**	M = 23.13
New Mexico	S.D. = 1.26	S.D. = .88		
Combined School				
Achievement	N = 126	N = 98		N = 224
Status Means	M = 22.90	M = 23.16	M = -.26*	M = 23.01

* Significant at .05 level

** Significant at .01 level

Table 3. 3

MEAN HOME-FAMILY NES-NSG-AREA SCORES (1964) BY ACHIEVEMENT STATUS (1967) FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	Graduate	-	Non-graduate	=	Difference	
Luther Hospital	N = 24		N = 31			N = 55
Eau Claire, Wis.	M = 7.92		M = 8.10		M = -.18	M = 8.02
	S.D. = .83		S.D. = 1.04			
Holy Family	N = 29		N = 4			N = 33
Hospital	M = 7.48		M = 7.75		M = -.27	M = 7.51
Manitowoc, Wis.	S.D. = .78		S.D. = .50			
Madison General	N = 12		N = 16			N = 28
Hospital	M = 7.58		M = 7.63		M = -.05	M = 7.61
Madison, Wis.	S.D. = .67		S.D. = 1.15			
Henry W. Bishop	N = 20		N = 14			N = 34
Pittsfield, Mass.	M = 7.75		M = 7.41		M = +.34	M = 7.74
	S.D. = .64		S.D. = .83			
Lutheran Hospital	N = 31		N = 5			N = 36
Cleveland, Ohio	M = 7.55		M = 7.60		M = -.05	M = 7.56
	S.D. = .89		S.D. = .55			
Regina School	N = 10		N = 28			N = 38
Albuquerque,	M = 7.80		M = 8.39		M = -.59	M = 8.24
New Mexico	S.D. = .79		S.D. = .88			
Combined School						
Achievement	N = 126		N = 98			N = 224
Status Means	M = 7.66		M = 7.97		M = -.31	M = 7.80

Table 3.4

MEAN RESPONSIBILITY NES-NSG-AREA SCORES (1964)
BY ACHIEVEMENT STATUS (1967)
FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	Graduate -	Non-graduate =	Difference	
Luther Hospital	N = 24	N = 31		N = 55
Eau Claire, Wis.	M = 13.79	M = 14.48	M = -.69	M = 14.18
	S.D. = 1.32	S.D. = 1.46		
Holy Family	N = 29	N = 4		N = 33
Hospital	M = 14.03	M = 14.50	M = -.47	M = 14.09
Manitowoc, Wis.	S.D. = 1.05	S.D. = 1.29		
Madison General	N = 12	N = 16		N = 28
Hospital	M = 13.58	M = 13.88	M = -.30	M = 13.75
Madison, Wis.	S.D. = .90	S.D. = 1.20		
Henry W. Bishop	N = 20	N = 14		N = 34
Pittsfield, Mass.	M = 14.10	M = 14.64	M = -.54	M = 14.32
	S.D. = 1.21	S.D. = 1.15		
Lutheran Hospital	N = 31	N = 5		N = 36
Cleveland, Ohio	M = 13.74	M = 15.20	M = -1.46*	M = 13.94
	S.D. = 1.41	S.D. = 1.30		
Regina School	N = 10	N = 28		N = 38
Albuquerque,	M = 13.00	M = 14.29	M = -1.29*	M = 13.95
New Mexico	S.D. = 1.25	S.D. = 1.33		
Combined School				
Achievement	N = 126	N = 98		N = 224
Status Means	M = 13.80	M = 14.39	M = -.59**	M.= 14.06

*Significant at .05 level
**Significant at .01 level

Table 3.5

MEAN OTHERS-LOVE-MARRIAGE NES-NSC-AREA SCORES (1964) BY ACHIEVEMENT STATUS (1967) FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	Graduate -	Non-graduate =	Difference	
Luther Hospital	N = 24	N = 31		N = 55
Eau Claire, Wis.	M = 10.88	M = 11.65	M = -.77*	M = 11.31
	S.D. = .80	S.D. = 1.40		
Holy Family	N = 29	N = 4		N = 33
Hospital	M = 11.69	M = 12.25	M = -.56	M = 11.76
Manitowoc, Wis.	S.D. = 1.04	S.D. = .96		
Madison General	N = 12	N = 16		N = 28
Hospital	M = 11.25	M = 11.63	M = -.38	M = 11.46
Madison, Wis.	S.D. = 1.14	S.D. = 1.09		
Henry W. Bishop	N = 20	N = 20		N = 34
Pittsfield, Mass.	M = 11.70	M = 12.21	M = -.51	M = 11.91
	S.D. = 1.03	S.D. = 1.12		
Lutheran Hospital	N = 31	N = 5		N = 36
Cleveland, Ohio	M = 11.48	M = 12.00	M = -.52	M = 11.56
	S.D. = 1.34	S.D. = 1.41		
Regina School	N = 10	N = 28		N = 38
Albuquerque,	M = 11.50	M = 11.96	M = -.46	N = 11.84
New Mexico	S.D. = .97	S.D. = 1.29		
Combined School Achievement	N = 126	N = 98		N = 224
Status Means	M = 11.43	M = 11.86	M = -.43**	M = 11.62

* Significant at .05 level

** Significant at .01 level

Table 3.6

MEAN ACADEMIC NES-NSC-AREA SCORES (1964) BY ACHIEVEMENT STATUS (1967) FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	Graduate	-	Non-graduate	=	Difference	
Luther Hospital	N = 24		N = 31			N = 55
Eau Claire, Wis.	M = 10.04		M = 10.19		M = -.15	M = 10.13
	S.D. = 1.08		S.D. = 1.51			
Holy Family	N = 29		N = 4			N = 33
Hospital	M = 10.17		M = 11.00		M = -.83	M = 10.27
Manitowoc, Wis.	S.D. = 1.14		S.D. = 1.41			
Madison General	N = 12		N = 16			N = 28
Hospital	M = 10.33		M = 9.94		M = +.39	M = 10.11
Madison, Wis.	S.D. = .98		S.D. = 1.18			
Henry W. Bishop	N = 20		N = 14			N = 34
Pittsfield, Mass.	M = 10.45		M = 10.64		M = -.19	M = 10.53
	S.D. = 1.36		S.D. = 1.15			
Lutheran Hospital	N = 31		N = 5			N = 36
Cleveland, Ohio	M = 9.58		M = 10.20		M = -.62	M = 9.67
	S.D. = 1.03		S.D. = 1.10			
Regina School	N = 10		N = 28			N = 38
Albuquerque,	M = 10.60		M = 10.96		M = -.36	M = 10.87
New Mexico	S.D. = .84		S.D. = 1.17			
Combined School						
Achievement	N = 126		N = 98			N = 224
Status Means	M = 10.09		M = 10.47		M = -.38	M = 10.26

Table 3.7

MEAN TOTAL NES-NSG SCORES (1964)
BY ACHIEVEMENT STATUS (1967)
FOR 224 NURSING STUDENTS AT 6 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	Graduate -	Non-graduate =	Difference	
Luther Hospital Eau Claire, Wis.	N = 24 M = 74.17 S.D. = 3.40	N = 31 M = 76.84 S.D. = 3.46	M = -2.67**	N = 55 M = 75.67
Holy Family Hospital Manitowoc, Wis.	N = 29 M = 75.55 S.D. = 2.60	N = 4 M = 77.25 S.D. = 1.26	M = -1.70	N = 33 M = 75.76
Madison General Hospital Madison, Wis.	N = 12 M = 74.33 S.D. = 3.11	N = 16 M = 75.06 S.D. = 3.02	M = -.73	N = 28 M = 74.75
Henry W. Bishop Pittsfield, Mass.	N = 20 M = 74.70 S.D. = 2.20	N = 14 M = 77.71 S.D. = 3.00	M = -3.01**	N = 34 M = 75.94
Lutheran Hospital Cleveland, Ohio	N = 31 M = 74.10 S.D. = 3.94	N = 5 M = 78.20 S.D. = 4.32	M = -4.10*	N = 36 M = 74.67
Regina School Albuquerque, New Mexico	N = 10 M = 74.20 S.D. = 2.57	N = 28 M = 78.39 S.D. = 3.35	M = -4.19**	N = 38 M = 77.29
Combined School Achievement Status Means	N = 126 M = 74.57	N = 98 M.= 77.20	M = -2.63**	N = 224 M = 75.72

* Significant at .05 level
** Significant at .01 level

Table 3. 8

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NSC SCORES
AT LUTHER HOSPITAL SCHOOL OF NURSING (1964)

Source	df	Nurs-ing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	8.40**	.31	.48	3.31	5.77*	.17	8.21**
Residual	53	(.76)	(1.56)	(.91)	(1.96)	(1.39)	(1.81)	(11.76)
Total	54							

* Significant at .05 level
** Significant at .01 level

Table 3. 9

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NSC SCORES
AT HOLY FAMILY HOSPITAL SCHOOL OF NURSING (1964)

Source	df	Nurs-ing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	.08	.88	.43	.66	1.04	1.77	1.62
Residual	31	(.89)	(1.26)	(.58)	(1.16)	(1.06)	(1.36)	(6.26)
Total	32							

Table 3.10

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NSC SCORES AT MADISON GENERAL HOSPITAL SCHOOL OF NURSING (1964)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	1.51	.02	.01	.49	.78	.88	.39
Residual	26	(1.04)	(1.45)	(.95)	(1.18)	(1.23)	(1.22)	(9.37)
Total	27							

Table 3.11

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NSC SCORES AT HENRY W. BISHOP SCHOOL OF NURSING (1964)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	6.95*	4.85*	.02	1.73	1.91	.19	11.45**
Residual	32	(.60)	(2.00)	(.52)	(1.41)	(1.14)	(1.63)	(6.53)
Total	33							

* Significant at .05 level
** Significant at .01 level

Table 3.12

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NSC SCORES
AT LUTHERAN HOSPITAL SCHOOL OF NURSING (1964)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	1.19	.96	.02	4.66*	.63	1.54	4.57*
Residual	34	(1.11)	(2.69)	(.73)	(1.96)	(1.82)	(1.07)	(15.87)
Total	35							

* Significant at .05 level

Table 3.13

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NSC SCORES
AT REGINA SCHOOL OF NURSING (1964)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	1.25	7.45**	3.55	7.11*	1.07	.81	12.87**
Residual	36	(1.43)	(.97)	(.73)	(1.71)	(1.49)	(1.20)	(10.06)
Total	37							

* Significant at .05 level
** Significant at .01 level

Table 3.14

F RATIOS AND ERROR MEAN SQUARES
FROM ANALYSES OF VARIANCES OF AREA AND TOTAL
NES-NSC SCORES AT SIX SCHOOLS OF NURSING (1964)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Nursing School	5	.33	1.49	1.73	1.77	2.15	2.07	.92
Achievement Status	1	11.21**	3.91*	1.81	15.98**	9.05**	2.45	30.14**
Nursing School x Achievement Status	5	.24	1.46	.46	.83	.13	.67	1.09
Error Mean Square	212	(.96)	(1.66)	(.75)	(1.62)	(1.37)	(1.43)	(10.29)

* Significant at .05 level
** Significant at .01 level

Table 3.15

SUMMARY OF NES-NSC-AREA AND TOTAL SCORES (1964) DIFFERENTIATING (.05 LEVEL OR GREATER) GRADUATES FROM NON-GRADUATES (1967) AT SIX SCHOOLS OF NURSING

	NES-NSC Scales						
Nursing School	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Luther Hospital Eau Claire, Wis.	.01				.05		.01
Holy Family Manitowoc, Wis.							
Madison General Madison, Wis.							
Henry W. Bishop Pittsfield, Mass.	.05	.05					.01
Lutheran Hospital Cleveland, Ohio				.05			.05
Regina School Albuquerque, N. M.		.01		.05			.01
Combined	.01	.05		.01	.01		.01

Table 3.16

ADMISSION NES-NSC TOTAL SCORES (1964) BY ACHIEVEMENT STATUS OF STUDENTS (1967) AT 6 SCHOOLS OF NURSING

NES-NSC	Luther		Holy Family	
Total Scores	Graduate	Non-graduate	Graduate	Non-graduate
87	0	0	0	0
86	0	0	0	0
85	0	1	0	0
84	0	0	0	0
83	0	0	0	0
82	0	2	0	0
81	0	2	1	0
80	0	2	0	0
79	3	2	4	1
78	3	5	2	0
77	2	2	4	2
76	1	3	4	1
75	1	4	3	0
74	3	2	2	0
73	2	3	6	0
72	4	2	2	0
71	1	1	1	0
70	2	0	0	0
69	1	0	0	0
68	1	0	0	0
67	0	0	0	0
66	0	0	0	0
65	0	0	0	0
	N=24	N=31	N=29	N=4

NES-NSC	Madison General		Henry W. Bishop	
Total Scores	Graduate	Non-graduate	Graduate	Non-graduate
87	0	0	0	0
86	0	0	0	0
85	0	0	0	0
84	0	0	0	0
83	0	0	0	0
82	0	0	0	2
81	0	0	0	0
80	1	2	0	1
79	0	1	1	4
78	1	1	1	1
77	0	2	2	1
76	2	0	3	3
75	2	1	4	0
74	2	3	4	1
73	1	2	1	0
72	1	3	2	0
71	0	1	2	1
70	1	0	0	0
69	1	0	0	0
68	0	0	0	0
67	0	0	0	0
66	0	0	0	0
65	0	0	0	0
	N=12	N=16	N=20	N=14

Table 3.16 (continued)

ADMISSION NES-NSC TOTAL SCORES (1964) BY ACHIEVEMENT STATUS OF STUDENTS (1967) AT 6 SCHOOLS OF NURSING

NES-NSC	Lutheran		Regina	
Total Scores	Graduate	Non-graduate	Graduate	Non-graduate
87	0	0	0	1
86	0	0	0	0
85	0	0	0	0
84	0	0	0	0
83	1	0	0	2
82	0	1	0	1
81	0	1	0	3
80	0	0	0	5
79	1	1	1	2
78	5	1	0	4
77	2	0	1	1
76	4	0	1	3
75	2	0	1	2
74	4	0	2	3
73	2	0	0	0
72	2	0	3	1
71	1	1	1	0
70	2	0	0	0
69	3	0	0	0
68	1	0	0	0
67	0	0	0	0
66	0	0	0	0
65	1	0	0	0
	N=31	N=5	N=10	N=28

NES-NSC	Six Schools Combined	
Total Scores	Graduate	Non-graduate
87	0	1
86	0	0
85	0	1
84	0	0
83	1	2
82	0	6
81	1	6
80	1	10
79	10	11
78	12	12
77	11	8
76	15	10
75	13	7
74	17	9
73	12	5
72	14	6
71	6	4
70	5	0
69	5	0
68	2	0
67	0	0
66	0	0
65	1	0
	N=126	N=98

Table 3.17

MEAN NURSING NES-NSC-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 8.67	M = 10.20	M = -1.53**	M = 8.89
Manitowoc, Wis.	S.D. = 1.03	S.D. = 1.48		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 8.50	M = 9.60	M = -1.10*	M = 9.05
Madison, Wis.	S.D. = .71	S.D. = 1.17		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M. = 9.19	M = 9.27	M = -.08	M = 9.23
	S. D. = 1.11	S.D. = 1.16		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 9.34	M = 9.18	M = +.16	M = 9.30
	S.D. = 1.01	S.D. = .98		
Regina School	N = 13	N = 23		N = 36
Albqquerque,	M = 9.31	M = 9.22	M = +.09	M = 9.25
New Mexico	S.D. = .75	S.D. = 1.13		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 9.07	M = 9.23	M = -.16	M = 9.12
Miama, Florida	S.D. = .98	S.D. = .99		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 8.61	M = 9.33	M = -.72	M = 8.78
Louisiana	S.D. = 1.20	S.D. = .71		
Emanuel Hospital	N = 85	N = 21		N = 106
Portland, Oregon	M = 9.24	M = 9.19	M = +.05	M = 9.23
	S.D. = 1.21	S.D. = .93		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 9.06	M = 9.29	M = -.23**	M = 9.13

* Significant at .05 level

** Significant at .01 level

Table 3.18

MEAN SELF NES-NSC-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 22.67	M = 22.40	M = +.27	M = 22.63
Manitowoc, Wis.	S. D. = .92	S.D. = .89		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 22.80	M = 22.60	M = +.20	M = 22.70
Madison, Wis.	S.D. = 1.32	S.D. = 1.17		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M = 22.69	M = 23.53	M = -.84	M = 23.10
	S.D. = 1.58	S.D. = 1.36		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 23.10	M = 23.18	M = -.08	M = 23.13
	S.D. = 1.21	S.D. = 1.94		
Regina School	N = 13	N = 23		N = 36
Albuquerque,	M = 23.00	M = 22.91	M = +.09	M = 22.94
New Mexico	S.D. = 1.35	S.D. = 1.65		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 23.06	M = 23.47	M = -.41	M = 23.20
Miami, Florida	S.D. = 1.36	S.D. = 1.32		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 22.89	M = 22.89	M = .00	M = 22.89
Louisiana	S.D. = 1.31	S.D. = 1.27		
Emanuel Hospital	N = 85	N = 21		N = 106
Portland, Oregon	M = 23.16	M = 23.71	M = -.55	M = 23.27
	S.D. = 1.29	S.D. = 1.79		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 23.01	M = 23.27	M = -.26	M = 23.09

Table 3. 19

MEAN HOME-FAMILY NES-NSC-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 7.73		M = 7.80		M = -.07	M = 7.74
Manitowoc, Wis.	S.D. = .78		S.D. = 1.10			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 7.00		M = 7.20		M = -.20	M = 7.10
Madison, Wis.	S.D. = .67		S.D. = .79			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 7.81		M = 7.93		M = -.12	M = 7.87
	S.D. = .54		S.D. = .70			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 7.52		M = 8.18		M = -.66	M = 7.70
	S.D. = 1.02		S.D. = .98			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 7.15		M = 8.26		M = -1.11**	M = 7.86
New Mexico	S.D. = .38		S.D. = .92			
Jackson Memorial	N = 105		N = 53			N = 158
Hospital	M = 7.84		M = 8.08		M = -.24	M = 7.92
Miama, Florida	S.D. = .87		S.D. = 1.03			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 7.86		M = 7.33		M = +.53	M = 7.73
Louisiana	S.D. = .97		S.D. = .71			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 7.82		M = 8.38		M = -.56*	M = 7.93
	S.D. = .99		S.D. = 1.07			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 7.74		M = 8.03		M = -.29**	M = 7.83

* Significant at .05 level

** Significant at .01 level

Table 3.20

MEAN RESPONSIBILITY NES-NSC-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 14.00		M = 14.00		M = .00	M = 14.00
Manitowoc, Wis.	S.D. = 1.39		S.D. = .71			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 13.50		M = 14.30		M = -.80	M = 13.90
Madison, Wis.	S.D. = .97		S.D. = 1.34			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 13.38		M = 14.53		M = -1.15*	M = 13.94
	S.D. = 1.75		S.D. = 1.86			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 13.41		M = 14.64		M = -1.23**	M = 13.75
	S.D. = 1.12		S.D. = 1.43			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 13.15		M = 13.65		M = -.50	M = 13.47
New Mexico	S.D. = .69		S.D. = 1.43			
Jackson Memorial	N = 105		N = 53			N = 158
Miami, Florida	M = 13.26		M = 13.81		M = -.55**	M = 13.44
	S.D. = 1.29		S.D. = 1.13			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 13.96		M = 14.67		M = -.71	M = 14.14
Louisiana	S.D. = 1.57		S.D. = 1.12			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 13.95		M = 14.05		M = -.10	M = 13.97
	S.D. = 1.19		S.D. = 1.66			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 13.60		M = 14.05		M = -.45**	M = 13.74

* Significant at .05 level

** Significant at .01 level

Table 3.21

MEAN OTHERS-LOVE-MARRIAGE NES-NSC-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family Hospital Manitowoc, Wis.	N = 30 M = 11.90 S.D. = 1.13	N = 5 M = 12.60 S.D. = .89	M = -.70	N = 35 M = 12.00
Madison General Hospital Madison, Wis.	N = 10 M = 11.00 S.D. = .94	N = 10 M = 11.20 S.D. = 1.14	M = -.20	N = 20 M = 11.10
Henry W. Bishop Pittsfield, Mass.	N = 16 M = 11.88 S.D. = .96	N = 15 M = 12.20 S.D. = 1.26	M = -.32	N = 31 M = 12.03
Lutheran Hospital Cleveland, Ohio	N = 29 M = 11.34 S.D. = 1.32	N = 11 M = 11.82 S.D. = .98	M = -.48	N = 40 M = 11.48
Regina School Albuquerque, New Mexico	N = 13 M = 11.69 S.D. = .85	N = 23 M = 12.17 S.D. = 1.40	M = -.48	N = 36 M = 12.00
Jackson Memorial Hospital Miami, Florida	N = 105 M = 11.41 S.D. = 1.13	N = 53 M = 11.93 S.D. = 1.25	M = -.52**	N = 158 M = 11.59
Mercy Hospital New Orleans, Louisiana	N = 28 M = 11.11 S.D. = 1.13	N = 9 M = 12.22 S.D. = .83	M = -1.11*	N = 37 M = 11.38
Emanuel Hospital Portland, Oregon	N = 85 M = 11.58 S.D. = 1.27	N = 21 M = 11.76 S.D. = 1.55	M = -.18	N = 106 M = 11.61
Combined School Achievement Status Means	N = 316 M = 11.49	N = 147 M = 11.95	M = -.46**	N = 463 M = 11.64

* Significant at .05 level

** Significant at .01 level

Table 3.22

MEAN ACADEMIC NES-NSC-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 9.77		M = 10.20		M = -.53	M = 9.83
Manitowoc, Wis.	S.D. = 1.22		S.D. = 1.48			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 9.50		M = 10.00		M = -.10	M = 9.75
Madison, Wis.	S.D. = .97		S.D. = 1.56			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 10.44		M = 10.73		M = -.29	M = 10.58
	S.D. = 1.32		S.D. = 1.16			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 9.79		M = 9.82		M = -.03	M = 9.80
	S.D. = 1.18		S.D. = 1.17			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 10.00		M = 10.13		M = -.13	M = 10.08
New Mexico	S.D. = 1.47		S.D. = .81			
Jackson Memorial	N = 105		N = 53			N = 158
Hospital	M = 10.67		M = 11.15		M = -.48*	M = 10.83
Miami, Florida	S.D. = 1.20		S.D. = .95			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 10.32		M = 10.44		M = -.12	M = 10.35
Louisiana	S.D. = 1.19		S.D. = 1.13			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 10.39		M = 10.24		M = +.15	M = 10.36
	S.D. = 1.27		S.D. = 1.04			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 10.32		M = 10.56		M = -.24	M = 10.40

* Significant at .05 level

Table 3.23

MEAN TOTAL NES-NSC-AREA SCORES (1965)
BY ACHIEVEMENT STATUS (1967)
FOR 463 NURSING STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 74.33		M = 77.20		M = -2.87	M = 75.09
Manitowoc, Wis.	S.D. = 2.87		S.D. = 2.17			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 72.30		M = 74.90		M = -2.60	M = 73.60
Madison, Wis.	S.D. = 1.89		S.D. = 3.82			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 75.38		M = 78.20		M = -2.82*	M = 76.74
	S.D. = 3.74		S.D. = 3.59			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 74.52		M = 76.82		M = -2.30	M = 75.15
	S.D. = 3.24		S.D. = 3.89			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 74.31		M = 76.35		M = -2.04	M = 75.61
New Mexico	S.D. = 2.87		S.D. = 3.02			
Jackson Memorial	N = 105		N = 53			N = 158
Hospital	M = 75.34		M = 77.68		M = -2.34**	M = 76.13
Miami, Florida	S.D. = 3.03		S.D. = 2.61			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 74.50		M = 76.89		M = -2.39	M = 75.27
Louisiana	S.D. = 3.48		S.D. = 2.52			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 76.14		M = 77.33		M = -1.19	M = 76.38
	S.D. = 3.01		S.D. = 4.41			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 75.17		M = 77.15		M = -1.98**	M = 75.80

* Significant at .05 level
** Significant at .01 level

Table 3.24

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA, VALIDATION, AND
TOTAL NES-NSC SCORES
AT HOLY FAMILY HOSPITAL SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	8.43**	.36	.03	.01	1.74	.51	3.33
Residual	33	(1.20)	(.84)	(.69)	(1.76)	(1.21)	(1.58)	(7.84)
Total	34							

** Significant at .01 level

Table 3.25

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA, VALIDATION, AND
TOTAL NES-NSC SCORES
AT MADISON GENERAL HOSPITAL SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	6.44*	.13	.38	2.34	.18	.74	3.73
Residual	18	(.94)	(1.56)	(.53)	(1.37)	(1.09)	(1.69)	(9.06)
Total	19							

* Significant at .05 level

Table 3.26

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA, VALIDATION, AND TOTAL NES-NSC SCORES AT HENRY W. BISHOP SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	.04	2.54	.29	4.21*	.66	.44	4.59*
Residual	29	(1.29)	(2.18)	(.39)	(2.46)	(1.25)	(1.55)	(13.45)
Total	30							

* Significant at .05 level

Table 3.27

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA, VALIDATION, AND TOTAL NES-NSC SCORES AT LUTHERAN HOSPITAL SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	.21	.02	3.44	8.15**	1.17	.01	3.61
Residual	38	(1.01)	(2.06)	(1.02)	(1.46)	(1.53)	(1.38)	(11.71)
Total	39							

** Significant at .01 level

Table 3.28

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA, VALIDATION, AND
TOTAL NES-NSC SCORES
AT REGINA SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	.07	.03	17.19**	1.38	1.26	.12	3.92
Residual	34	(1.02)	(2.41)	(.59)	(1.50)	(1.53)	(1.19)	(8.82)
Total	35							

** Significant at .01 level

Table 3.29

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA, VALIDATION, AND
TOTAL NES-NSC SCORES
AT JACKSON MEMORIAL SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	.92	3.34	2.31	7.09**	7.05**	6.57*	22.91**
Residual	156	(.97)	(1.81)	(.86)	(1.53)	(1.37)	(1.26)	(8.39)
Total	157							

* Significant at .05 level
** Significant at .01 level

Table 3.30

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA, VALIDATION, AND TOTAL NES-NSC SCORES AT MERCY HOSPITAL SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	2.95	.01	2.22	1.53	7.37*	.07	2.83
Residual	35	(1.22)	(1.70)	(.84)	(2.20)	(1.15)	(1.38)	(10.80)
Total	36							

* Significant at .05 level

Table 3.31

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA, VALIDATION, AND TOTAL NES-NSC SCORES AT EMANUEL HOSPITAL SCHOOL OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Treatment	1	.03	2.59	5.17*	.09	.33	.25	2.17
Residual	104	(1.35)	(1.96)	(1.01)	(1.68)	(1.76)	(1.52)	(11.05)
Total	105							

* Significant at .05 level

Table 3. 32

F RATIOS AND ERROR MEAN SQUARES FROM ANALYSES OF VARIANCE OF NES-NSC SCORES AT EIGHT SCHOOLS OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Nursing School	7	.90	1.49	3.13*	2.91**	1.89	6.43**	3.37**
Achievement Status	1	4.92*	4.16*	11.74**	14.43**	13.71**	3.28	39.18**
Nursing School x Achievement Status	7	2.09*	.67	2.19*	1.00	.50	.59	.32
Error Mean Square	447	(1.12)	(1.85)	(.83)	(1.68)	(1.44)	(1.39)	(9.83)

* Significant at .05 level
**Significant at .01 level

Table 3. 33

SUMMARY OF NES-NSC-AREA AND TOTAL SCORES (1965) DIFFERENTIATING (. 05 LEVEL OR GREATER) STUDENTS ENROLLED FROM STUDENTS NO LONGER ENROLLED AFTER TWO YEARS (1967) AT EIGHT SCHOOLS OF NURSING

	NES-NSC Scales						
Nursing School	Nursing	Self	Home-Family	Resp.	O-L-M	Academic	Total
Holy Family Manitowoc, Wis.	.01						
Madison General Madison, Wis.	.05						
Henry W. Bishop Pittsfield, Mass.				.05			.05
Lutheran Hospital Cleveland, Ohio				.01			
Regina School Albuquerque, N. M.			.01				
Jackson Memorial Miami, Florida				.01	.01	.05	.01
Mercy Hospital New Orleans, La.					.05		
Emanuel Hospital Portland, Oregon			.05				
Combined	.01		.01	.01	.01		.01

Table 3.34

ADMISSION NES-NSC TOTAL SCORES (1965) BY ACHIEVEMENT STATUS OF STUDENTS (1967) AT 8 SCHOOLS OF NURSING

NES-NSC Total	Holy Family		Madison General		Henry W. Bishop	
Scores	In School	Not In School	In School	Not in School	In School	Not in School
85	0	0	0	0	0	1
84	0	0	0	0	0	1
83	0	0	0	0	0	0
82	0	0	0	1	1	1
81	0	1	0	0	0	1
80	0	0	0	0	0	1
79	4	0	0	1	2	1
78	1	0	0	0	2	1
77	4	1	0	1	1	3
76	3	3	0	1	4	1
75	4	0	1	1	1	2
74	5	0	2	1	1	1
73	4	0	2	2	0	1
72	0	0	2	0	0	0
71	2	0	1	1	2	0
70	1	0	1	0	0	0
69	2	0	1	1	2	0
68	0	0	0	0	0	0
67	0	0	0	0	0	0
66	0	0	0	0	0	0
65	0	0	0	0	0	0
	N=30	N=5	N=10	N=10	N=16	N=15

NES-NSC Total	Lutheran		Regina		Jackson Memorial	
Scores	In School	Not in School	In School	Not in School	In School	Not in School
85	0	0	0	0	0	0
84	0	1	0	0	0	0
83	0	1	0	0	1	0
82	0	0	0	0	1	4
81	1	0	0	0	1	2
80	0	0	0	3	1	9
79	0	1	1	3	11	7
78	5	0	1	4	18	6
77	3	2	1	3	10	8
76	2	1	2	3	11	6
75	4	3	2	0	7	3
74	4	0	0	3	11	5
73	2	0	2	2	14	1
72	4	2	1	1	8	1
71	2	0	2	0	6	1
70	1	0	1	0	3	0
69	0	0	0	0	0	0
68	0	0	0	1	2	0
67	0	0	0	0	0	0
66	0	0	0	0	0	0
65	1	0	0	0	0	0
	N=29	N=11	N=13	N=23	N=105	N=53

Table 3. 34 (continued)

ADMISSION NES-NSC TOTAL SCORES (1965) BY ACHIEVEMENT STATUS OF STUDENTS (1967) AT 8 SCHOOLS OF NURSING

NES-NSC Total	Mercy Hospital		Emanuel Hospital		Eight Schools Combined	
Scores	In School	Not in School	In School	Not in School	In School	Not in School
85	0	0	1	0	1	1
84	0	0	0	2	0	4
83	0	0	2	1	3	2
82	0	0	0	1	2	7
81	1	0	0	1	3	5
80	1	2	6	1	8	16
79	2	2	8	1	28	16
78	3	0	13	5	43	16
77	3	0	9	1	31	19
76	1	0	10	0	33	15
75	3	4	10	4	32	17
74	4	1	8	2	35	13
73	4	0	10	0	38	6
72	2	0	3	0	20	4
71	1	0	2	0	18	2
70	1	0	2	0	10	0
69	1	0	1	1	7	2
68	0	0	0	0	2	1
67	0	0	0	1	0	1
66	1	0	0	0	1	0
65	0	0	0	0	1	0
	N=28	N=9	N=85	N=21	N=316	N=147

Chapter 4

Nurse Attitudes Inventory (NAI), Forms I and II*

Introduction

The early promise of personality inventories in the field of nursing education has not been realized to any great extent. Thurston and Brunclik (1965b) have indicated that the complexity of the factors related to success in nursing education may preclude the finding of simple relationships of personality inventories performance to nursing school achievement (See Chapter 6). Among other problems, the difficulty of obtaining "truthful" responses to personality inventories or evaluating the effect of faking on test performance constitute chronic problems.

The ease of administration, simple and reliable machine scoring, and straightforward interpretation represent advantages for these inventories which may explain their continued use in the absence of anything approaching substantial evidence of validity. If these tests could demonstrate practical validity, then they could constitute a substantial source of assistance to schools of nursing. Nursing school faculties are always pressed for time and usually do not have professional psychologists available to them to interpret fully the findings of projective tests which have begun to show some promise (Mindess, 1957).

The development of the Nurse Attitudes Inventory (NAI) was undertaken in an effort to make available a device which would have many of the unique advantages of personality inventories while at the same time avoiding or minimizing the problems typically encountered with this type of test (Thurston and Brunclik, 1965a).

Basic Considerations in NAI Construction

Two primary considerations prevailed in the selection of the foils for the items of the Nurse Attitude Inventory (NAI). First and foremost, to what extent did a particular completion appear likely to differentiate successful from unsuccessful nursing students? Second, to what extent was a particular completion likely to be chosen by a student on the basis of her desire to be admitted to a nursing school rather than as it truthfully applied to her? Considerable effort was made to answer the first question during the development of the Nursing Education Scale (Chapter 2). The second point, the susceptibility of the test to falsification by applicants or new students was believed important enough to warrant extended attention. An attempt to lessen the likelihood of falsification and to allow for its detection thus became a major part of the research. This effort is detailed later in this chapter in the section titled "Student Tendancies to Choose Completions on Basis of Desirability".

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* A brief abstract describing early NAI development was published in the Research Reporter, Nursing Research, 1966, 15, 271-272.

NES Background for NAI Development

Inasmuch as the construction of the NAI was tied in very closely with the Nursing Education Scale a brief review of the NES development might be helpful at this point. In brief, of the 90 sentence stems of the Luther Hospital Sentence Completions, 59 stems were found to be effective in discriminating the successful from the withdrawal-failure nursing students (derivation sample). For these 59 stems, the number of completion categories which differentiated these groups ranged in number from one to five with the majority of stems having two categories. The differentiating categories of those 59 stems and the responses representing each constituted the Nursing Education Scale, Preliminary Form. When this scale was cross-validated on a new and independent sample of students, it was found that 40 of the stems continued to elicit differential response from successful and unsuccessful students (Thurston and Brunclik, 1965b). The 40 stems and the response categories constitute the Nursing Education Scale (NES). The NES is used as the basis for scoring Luther Hospital Sentence Completions (LHSC) and Nursing Sentence Completions (NSC). The 40 stems became the Nursing Sentence Completions (NSC). Thus, there were three sets of sentence stems: a) forty stems which were found to elicit differential response in terms of student achievement status in both the derivation and cross-validation samples of the NES development; b) nineteen stems which elicited such differential response only in the derivation sample; and c) thirty-one stems which failed to elicit differential response in the derivation sample (no investigation of these stems was undertaken in the cross-validation phase of this research). These will be referred to as the "a", "b", and "c" stems respectively in the following discussion.

Student Tendencies to Choose Completions On Basis of Desirability

The research on the problem of faking involved eight experimental forms called Exercises I, II, III, IV, V, VI, VII, and VIII. Exercise I consists of thirty-five sentence stems (20 "a" stems, 10 "b" stems and 5 "c" stems) each one of which has nine possible completions which represent categories whose relationship or lack of relationship to success in nursing education had been demonstrated as described above. Each of these completions was selected from those actually given by students in the research.

The following two items from Experimental Form I are illustrative:

1. WHEN I GO TO NURSING SCHOOL, MY FAMILY WILL . . . . .

_____ be proud
_____ have extra expense
_____ help finance my schooling
_____ be happy
_____ go on without me
_____ encourage me in my studies
_____ miss me
_____ not have to adjust too much
_____ want me to become a successful nurse and person

2. AT HOME, I . . . . .

_____ try to get along with my family
_____ am happy and relaxed
_____ usually express myself freely
_____ have fun
_____ watch TV
_____ find sleeping a good pastime
_____ don't get into trouble
_____ am expected to do my share of the work
_____ feel secure

In completing an Experimental Form, each student was asked to rank the nine completions for each of the thirty-five sentence stems on the basis of its creating a favorable impression for an applicant upon the admission committee of a nursing school. The number "1" was placed in front of the completion that the student thought would be best for this purpose, "2" in front of the next and so on until "9" was placed before the completion that the student felt was the least likely of those available to create a favorable impression upon this admission committee.

Primary selection criteria for the completions were as follows for the "a" stems: 1) Each list of nine completions included one or two responses representing categories which had consistently differentiated the nursing achievement categories in both derivation and cross-validation samples. 2) In selecting other foils, a preference was accorded those completions which differentiated the achievement groups only in the derivation sample. 3) The remaining foils would be drawn from those which did not appear to differentiate the achievement groups at any time. The completions for the "b" stems involved only the second and third criteria. The "c" stem foils were of necessity selected on the basis of the third criterion alone.

The selection of completions was guided by the following additional considerations. Inasmuch as possible, responses were avoided which in the opinion of the researchers, were obviously those that an applicant would give or avoid if she wished to be admitted. The responses chosen for particular categories were not consistently longer nor shorter than others. All choices were appropriate grammatically to the sentence stems.

Exercise II consisted of thirty-five sentence stems (20 "a" stems, 9 "b" stems and 6 "c" stems) each having nine possible completions as indicated for Exercise I. All the stems of Exercise II were different from those found in Exercise I.

Exercise III consisted of the same "a" and "b" stems as were used in Exercise I. For each stem, the nine completions were different from those found in Exercise I. The five "c" sentence stems and the completions were entirely different from those in Exercise I.

Exercise IV consisted of the same "a" and "b" sentence stems as Exercise II. The nine possible completions for each stem were different from those of Exercise II. The six "c" stems and completions were completely different from those in Exercise II.

In each of the Exercises I, II, III, IV, the order of the sentence stems was determined by its original position in the LHSC. The order of the nine completions to each sentence stem was assigned by means of random numbers.

Exercises V, VI, VII, and VIII are complete reversals of Exercises I, II, III, and IV, respectively. Each has the same sentence stems as their counterparts (ExercisesI and V, Exercises II and VI, Exercises III and VII, and IV and VIII) and the nine completions are the same for each item. The order of both stems and completions, however, has been completely reversed. What was the first of the nine completions to stem 1 of Exercise I was the last of the nine completions to stem 35 of Exercise V. The last of the nine completions to the last stem of Exercise I was the first of the nine completions to the first stem of Exercise V. The same complete reversals held true for Exercises II and VI, III and VII, IV and VIII.

The substantial effort involved in the use of additional Exercises V, VI, VII, and VIII was believed necessary to compensate for any "order effect" which might exert a systematic biasing effect upon these rankings. In other words, if a particular completion always appeared last for the last stem of an exercise it might be ranked differently than if it were always the first possible completion listed for the first sentence stem. Fatigue, "nervousness", and boredom of the student are only a few of the factors which might contribute to a systematic raising or lowering of the rank of a completion on this basis. Use of Exercises V through VIII in conjunction with Exercises I through IV was believed to minimize to a large extent this type of constant error. While the nature of "order effects" could be explored with the data of this research, it is of only tertiary interest in this study. Accordingly, this matter receives no further formal attention in this report.

The Exercises described above were administered during 1965 to all freshmen students at Luther Hospital School of Nursing, Eau Claire, Wisconsin (N=45), Henry W. Bishop Memorial School of Nursing, Pittsfield, Massachusetts (N=27), Lutheran Hospital School of Nursing, Cleveland, Ohio (N=35), and Regina School of Nursing, Albuquerque, New Mexico (N=34). Approximately equal numbers of Exercises I through VIII were administered at each school. The results deriving from Exercises I and V were combined as were Exercises

II and VI, III and VII, and IV and VIII. These combined pairs of exercises were referred to as Combo A, B, C, and D, respectively. Mean ratings for the nine completions to each of the 140 sentence stems were calculated. The computations involving the results from these four diploma schools, provided a basis for selection of items for the Nurse Attitudes Inventory. In addition, 32 junior students at Luther Hospital School of Nursing and 41 freshman students at Purdue University (two-year associate degree program) were given these exercises in order to provide additional, general information.

Selection of Items for Nurse Attitudes Inventory (NAI), Forms I and II

The data deriving from the 70 Combo A and B items became the basis for the Nurse Attitudes Inventory, Form I (Thurston and Brunclik, 1965a). Nurse Attitudes Inventory, Form II (Thurston and Brunclik, 1966) was constructed on the basis of the data of the 70 Combo C and D items. NAI, Forms I and II thus have 59 stems in common, although the possible completions are almost completely different for each sentence stem. Eleven sentence stems and completions of Form I and Form II are completely different.

In the selection of completions for the items of the NAI, the researchers were guided by the two basic considerations mentioned previously in this chapter: 1) the extent to which the completion was associated with success or failure in nursing education, and 2) the degree to which a completion would be chosen by students wishing to create a favorable impression upon a nursing school admissions committee.

In making the final selections for the NAI, emphasis was placed upon the first basic consideration. Each of the categories of the Nursing Education Scale (NES) is represented by at least one sentence completion to 40 of the stems of the NAI. In addition, an effort was made to have representation of those categories of the NES, Preliminary Form, which did not survive the cross-validation analysis. Decisions regarding which of the several completions to choose representing each of these significant and possibly significant categories were made in the light of information involving the second basic consideration, susceptibility to faking.

Modifications of Sentence Stems and Completions

In addition to the intensive checking of the tests by the researchers, the inventories were distributed to psychologists, social workers, and university students in order to allow them to respond critically to the form and its instructions. Changes were introduced on the basis of their suggestions.

At the same time that the stems and completions were being selected for the NAI, directions for its administration were being developed. Preliminary directions and several sample items were given to students at Wisconsin State University - Eau Claire as a pre-test. On the basis of their performance and suggestions they made, the direction sheets were modified until the final form emerged.

In the development of the Nurse Attitudes Inventories it was necessary to consider some minor editing of a few sentence stems because the form might be used for both applicants and newly-admitted students. An example of a sentence stem in need of modification was the following: "If not admitted to nursing school, I'll . . . . ." Administration of this significant item to new students already admitted to a school of nursing was not entirely appropriate. Shifting from the first to the third person was hard to justify. Separate forms would have been one answer, but two forms differing only in this way did not seem practical. Experience with the LHSC administered to new students revealed that it was only a minor problem. Since it was assumed that the NAI would probably be used most often with new students, the change was made to "If not admitted to nursing, I'd . . . . . ."

Administration Instructions and Two Examples of NAI Items

Instructions - In the test booklet you will find a number of sentence beginnings together with possible completions. Please read each sentence beginning and the five completions that follow it. In each case select the completion that most nearly resembles the one you yourself would make in completing the sentence. Record your answers on the separate answer sheet.

1. When I go to nursing school, my family . . . . .
    1. be proud
    2. have extra expense
    3. be happy
    4. miss me
    5. not have to adjust too much
2. In high school, I was happiest when I . . . . .
    1. could keep on the friendly side of everyone
    2. had good marks
    3. was participating with the band
    4. was with a group of friends either cheerleading or in a class play
    5. was a senior

Scoring of Nurse Attitudes Inventory (NAI)

Score Sheets and Scoring Stencils

Regular IBM score sheets were used to facilitate the recording of answers by students. These sheets could be hand-scored by means of stencils or scored electronically if the students used the special pencils required for such scoring.

Verification

In an effort to detect individual falsification on the NAI, two verification scales were constructed and identified as V-1 and V-2. Of the five foils chosen for each of the sentence stems of the NAI, one would have received the lowest mean rating and one the highest mean rating on the basis of their being chosen by students attempting to create a good impression upon an admission committee of a nursing school. The V-1 (Verification -1) scale consisted simply of seventy completions, each one of which had the lowest mean rating of the five completions for each of the seventy NAI stems. Inasmuch as the low rating reflected nursing student opinion that this was the one of five most likely to be chosen if one wished to create a good impression, it seemed reasonable to assume that this scale should evaluate the tendency to falsify.

The V-2 (Verification - 2) scale items consisted of seventy completions each of which was the highest ranked completion for each of the seventy NAI stems. In each instance, this was the completion of five which a student would be least likely to choose if she wished to make a good impression. It seemed worthwhile to determine if the scale could detect a tendency to create an unfavorable impression.

Area and Total NES-NAI Scores

The 40 sentence stems representing the NES scale were the only ones scored in terms of success or failure. Area scores were determined on the basis of responses to area items. Answers which represented responses more likely to be given by successful nursing students were given a score of one. Answers which represented responses given often by unsuccessful students were given a score of three. All other responses were given a score of two. After each area score had been obtained, all were added for the Total NES Score for the NAI.

Normative Standards

In the course of this research norms were established in percentile form for NES-NAI Total Scores and NES-NAI Area Scores for Forms I and II. These are based upon 463 and 385 NAI administrations respectively. The norms are presented in Appendices 2 and 3.

Results

Validation of Nursing Education Scale - NAI, Form I

The criterion measure for the validation of the NES-NAI was achievement status after approximately two years in nursing school, i. e. "with class" or "no longer in original class" (left for personal reasons, academic failure, delayed to next class, transferred to another school). The basis of the validation was the NAI performance of the students tested in 1965 and evaluation in accordance with this criterion in 1967. These students had previously taken the Nursing Sentence Completions as part of this 1965 test battery. Analysis of the results of the NSC testing have been given in Chapter 3 of this report.

Additional analyses involved a refinement of this criterion measure, e. g. "In school," "not in school - personal reasons," "not in school - academic reasons," "delayed to next class," or "transferred to another nursing school."

Analyses were conducted regarding the relation of seven NES-NAI Scores (Nursing, Self, Home-Family, Responsibility, Others-Love-Marriage, Academic, and Total) to the criterion described above.

The results of this portion of the study, as analyzed by analysis of variance (Scheffe, 1960) are reported in Tables 4. 1 - 4. 20. Statistical significance is reported if a differentiation between achievement categories is established at the . 05 level or greater.

1965 Testing (8 Schools of Nursing): 1967 Criterion - Achievement Status

Table 4. 1 shows the mean Nursing NES-NAI-Area score. Statistically significant F ratios were obtained for Mercy and for the eight schools combined.

The mean Self NES-NAI-Area scores are given in Table 4. 2. Significant F ratios were produced for achievement status at Jackson and for the eight schools combined.

Table 4. 3 shows the mean Home-Family NES-NAI-Area scores. Significant F ratios were obtained at Holy Family and for the eight schools combined.

The means of the Responsibility NES-NAI-Area scores are given in Table 4. 4. A significant F ratio was produced for the eight schools combined.

The mean Others-Love-Marriage NES-NAI-Area scores are found in Table 4. 5. No significant F ratios for achievement status were found for individual schools nor for the schools combined.

The mean Academic NES-NAI-Area scores are reported in Table 4. 6. A significant F ratio for achievement status was found only at Jackson.

The mean Total NES-NAI scores are given in Table 4. 7. Significant F ratios for achievement status are reported at Henry W. Bishop, Jackson, Mercy, and for the eight schools combined.

Table 4. 8 shows the mean V-1 (Verification - Fake Good) scores. Significant F ratios are reported at Henry W. Bishop, Jackson, and for the eight schools combined. In each instance those students still in school scored higher (more "fake good") than those no longer in school.

Table 4. 9 shows the mean V-2 (Verification - Fake Bad) scores. Significant F ratios were found at Jackson, Mercy, and for the eight schools combined. In all cases those students still in school scored lower (less "fake bad") than those no longer in school.

Tables 4. 10 - 4. 17 contain the analyses of variance for achievement status at Holy Family, Madison General, Henry W. Bishop, Lutheran, Regina, Jackson, Mercy, and Emanuel. Table 4. 18 presents an analysis of variance for achievement status for all eight of these schools combined.

Table 4. 19 is a summary of the NES-NAI Area, Total, and Validation scores (1965) Differentiating (. 05 level or greater) Students in School from

Students No Longer in School (1967) at Eight Schools of Nursing. Table 4.20 gives the distribution of NES-NAI Total Scores by achievement status at these eight schools.

In addition, multi-level analyses were conducted, into the relationship of NES-NAI scores to the categories describing different reasons why a student was no longer in her class. No consistent NES-NAI differences were noted among these different groupings.

Between school differences were noted on Self and Academic NES-NAI-Area, Verification - 2 ("Fake Poor"), and Total NES-NAI Scores.

Discussion

It would seem that many of the recommendations emphasized in the preceding chapter for NES-NSC Scores could be echoed here. Relationships have been established between NES-NAI Total and Area scores and success in nursing education at several schools. While there was no opportunity to evaluate year by year changes within a single school, inter-school differences in the strength of these relationships were again noted. The relationship of NES-NAI scores to categories describing the reasons for the students' withdrawal or failure was again evaluated. No consistent pattern of score differences among the categories emerged from this analysis.

It is believed that the NAI can be used most advantageously for research purposes as opposed to operational use at this time.

If the NAI is to be utilized operationally in the early identification of students likely to encounter trouble, it would seem that this must be preceded by study aimed at describing the predictive effectiveness of the NAI at the school considering such a usage. The ease of administration and scoring of this instrument constitutes marked advantages. It would also be desirable to study the effectiveness of the NAI as a supplement to other known good predictors. For example, does the NAI make a significant contribution to a battery of predictors which was already validated. Such a basic battery might include PNG scores, high school grades, and other biographical data.

An important research objective involved an exploration of the possibility to develop local scoring standards. The observed inter-school differences on the NAI suggests further the need for such research. However, it is acknowledged that the derivation of special NES scorings by individual schools would constitute an extraordinarily involved and time-consuming procedure. "Empirical NAI" scores for each school could be developed. These special scores deriving from this would be based upon the responses which were found to differentiate successful and unsuccessful students at each school.

The "Empirical NAI" scores derived on the basis of the performance of one class of students would have to be cross-validated on a new, independent class. The scores surviving this cross-validation might then constitute a NAI scoring device which would allow that school to make more precise predictions of failure-withdrawal than would be obtained through the usual NES-NAI scoring.

It may be that the NAI could have maximum value when used in conjunction with the NSC or LHSC. If the NES-NAI could be relied upon to predict failure at a given school, the NSC or LHSC records of the students so designated could be evaluated qualitatively to gather information on the specific nature of potential problem. This would yield more personal information regarding the student than a study of the NAI responses per se. If these two tests were used in concert, it would be best to have the NSC or LHSC administered before the NAI. Furthermore, as noted above, other test and biographical data could also be used in a multiple prediction system.

One of the most intriguing aspects of the NAI results involves the validation scales. Taking all schools into consideration, the students still in school after two years were more likely to have given "preferred" ("fake good") responses and less inclined to have given "least preferred" ("fake poor") responses than those students no longer in school. These scales may offer evidence bearing upon the motivations of prospective students. Students who were still in school may have wanted to enter school so badly that they were inclined to check those responses they felt were most likely to guarantee their acceptance and to avoid those responses which might jeopardize their positions. On the other hand the students who had not managed to remain in school or who were not proceeding according to schedule, may have lacked motivation for a career in nursing. It could be that these students either consciously or unconsciously may have "wanted" to be rejected and answered the NAI with that attitude in mind.

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Table 4. 1

MEAN NURSING NES-NAI-AREA SCORES (1965)
BY ACHIEVEMENT STATUS (1967)
FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 9.10	M = 10.00	M = -.90	M = 9.23
Manitowoc, Wis.	S.D. = 1.09	S.D. = 1.22		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 8.90	M = 9.50	M = -.60	M = 9.20
Madison, Wis.	S.D. = 1.45	S.D. = .71		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M = 9.13	M = 9.27	M = -.14	M = 9.20
	S.D. = 1.36	S.D. = 1.22		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 9.48	M = 9.73	M = -.25	M = 9.55
	S.D. = 1.02	S.D. = 1.10		
Regina School	N = 13	N = 23		N = 36
Albuquerque,	M = 8.69	M = 9.30	M = -.61	M = 9.08
New Mexico	S.D. = 1.11	S.D. = .97		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 9.08	M = 9.36	M = -.28	M = 9.17
Miami, Florida	S.D. = 1.14	S.D. = 1.06		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 9.25	M = 9.89	M = -.64*	M = 9.66
Louisiana	S.D. = .75	S.D. = .78		
Emanuel Hospital	N = 85	N = 21		N = 106
Portland, Oregon	M = 9.20	M = 9.43	M = -.23	M = 9.26
	S.D. = 1.14	S.D. = .87		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 9.15	M = 9.44	M = -.29**	M = 9.24

* Significant at .05 level
** Significant at .01 level

Table 4. 2

MEAN SELF NES-NAI-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 21.37	M = 21.00	M = +.37	M = 21.32
Manitowoc, Wis.	S.D. = 1.85	S.D. = 1.22		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 20.50	M = 20.80	M = -.30	M = 20.65
Madison, Wis.	S.D. = 1.18	S.D. = 1.14		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M = 19.63	M = 20.80	M = -1.17	M = 20.20
	S.D. = 1.59	S.D. = 1.78		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 21.24	M = 21.36	M = -.12	M = 21.27
	S.D. = 1.68	S.D. = 1.75		
Regina School	N = 13	N = 23		N = 36
Albuquerque,	M = 20.69	M = 20.30	M = +.39	M = 20.44
New Mexico	S.D. = 1.75	S.D. = 1.74		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 20.67	M = 21.89	M = -1.22**	M = 21.08
Miami, Florida	S.D. = 1.69	S.D. = 1.90		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 20.50	M = 21.33	M = -.83	M = 20.70
Louisiana	S.D. = 1.82	S.D. = 1.12		
Emanuel Hospital	N = 85	N = 21	+.07	N = 106
Portland, Oregon	M = 21.31	M = 21.24	M = ~~+.70~~	M = 21.30
	S.D. = 1.56	S.D. = 1.55		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 20.89	M = 21.26	M = -.37**	M = 21.01

* Significant at .05 level

** Significant at .01 level

Table 4. 3

MEAN HOME-FAMILY NES-NAI-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 7.83		M = 9.00		M = -1.17*	M = 8.00
Manitowoc, Wis.	S.D. = .87		S.D. = 1.41			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 7.90		M = 8.00		M = -.10	M = 7.95
Madison, Wis.	S.D. = 1.37		S.D. = .94			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 7.81		M = 8.40		M = -.59	M = 8.10
	S.D. = .98		S.D. = 1.12			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 8.00		M = 8.09		M = -.09	M = 8.02
	S.D. = 1.20		S.D. = 1.22			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 8.46		M = 8.17		M = +.29	M = 8.27
New Mexico	S.D. = 1.27		S.D. = 1.15			
Jackson Memorial	N = 105		N = 53			N = 158
Hospital	M = 8.09		M = 8.37		M = -.28	M = 8.18
Miami, Florida	S.D. = 1.08		S.D. = 1.15			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 8.25		M = 8.44		M = -.19	M = 8.30
Louisiana	S.D. = 1.08		S.D. = .88			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 8.29		M = 8.38		M = -.09	M = 8.31
	S.D. = 1.14		S.D. = .92			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 8.12		M = 8.32		M = -.20*	M = 8.18

* Significant at .05 level

Table 4. 4

MEAN RESPONSIBILITY NES-NAI-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 14.00		M = 14.40		M = -.40	M = 14.06
Manitowoc, Wis.	S.D. = 1.05		S.D. = 1.14			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 13.90		M = 13.70		M = +.20	M = 13.80
Madison, Wis.	S.D. = .99		S.D. = 1.34			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 13.69		M = 14.13		M = -.44	M = 13.90
	S.D. = 1.30		S.D. = 1.60			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 13.86		M = 14.18		M = -.32	M = 13.95
	S.D. = 1.36		S.D. = 1.47			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 13.54		M = 13.43		M = +.11	M = 13.47
New Mexico	S.D. = 1.27		S.D. = 1.31			
Jackson Memorial	N = 105		N = 53			N = 158
Hospital	M = 13.94		M = 14.15		M = -.21	M = 14.01
Miami, Florida	S.D. = 1.38		S.D. = 1.51			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 14.14		M = 15.11		M = -.97	M = 14.38
	S.D. = 1.63		S.D. = 1.36			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 14.08		M = 14.52		M = -.44	M = 14.17
	S.D. = 1.40		S.D. = 1.40			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 13.96		M = 14.13		M = -.17*	M = 14.01

* Significant at .05 level

Table 4. 5

MEAN OTHERS-LOVE-MARRIAGE NES-NAI-AREA SCORES (1965) BY ACHIEVEMENT STATUS (1967) FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 12.10		M = 12.00		M = +.10	M = 12.09
Manitowoc, Wis.	S.D. = 1.20		S.D. = 1.22			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 12.10		M = 12.40		M = -.30	M = 12.25
Madison, Wis.	S.D. = 1.20		S.D. = .70			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 12.25		M = 12.07		M = +.18	M = 12.16
	S.D. = 1.00		S.D. = 1.10			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 12.03		M = 11.91		M = +.12	M = 12.00
	S.D. = .98		S.D. = 1.22			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 12.69		M = 12.35		M = +.34	M = 12.47
New Mexico	S.D. = .94		S.D. = 1.15			
Jackson Hospital	N = 105		N = 53			N = 158
Miami, Florida	M = 12.34		M = 12.36		M = -.02	M = 12.35
	S.D. = 1.01		S.D. = 1.04			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 12.39		M = 12.22		M = +.17	M = 12.34
Louisiana	S.D. = .88		S.D. = 1.09			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 12.15		M = 12.33		M = -.18	M = 12.19
	S.D. = 1.01		S.D. = 1.15			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 12.24		M = 12.27		M = -.03	M = 12.25

Table 4. 6

MEAN ACADEMIC NES-NAI-AREA SCORES (1965)
BY ACHIEVEMENT STATUS (1967)
FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 9.93	M = 10.20	M = -.27	M = 9.97
Manitowoc, Wis.	S.D. = .91	S.D. = 1.79		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 9.60	M = 10.20	M = -.60	M = 9.90
Madison, Wis.	S.D. = .97	S.D. = .79		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M = 10.00	M = 10.40	M = -.40	M = 10.19
	S.D. = 1.21	S.D. = 1.18		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 9.83	M = 10.09	M = -.26	M = 9.90
	S.D. = 1.07	S.D. = 1.04		
Regina School	N = 13	N = 23		N = 36
Albuquerque,	M = 10.31	M = 10.30	M = +.01	M = 10.30
New Mexico	S.D. = 1.03	S.D. = 1.06		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 10.30	M = 10.74	M = -.44*	M = 10.45
Miami, Florida	S.D. = 1.25	S.D. = 1.04		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 10.25	M = 10.22	M = +.03	M = 10.24
Louisiana	S.D. = 1.17	S.D. = 1.09		
Emanuel Hospital	N = 85	N = 21		N = 106
Portland, Oregon	M = 9.91	M = 9.67	M = +.24	M = 9.86
	S.D. = 1.06	S.D. = 1.01		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 10.08	M = 10.35	M = -.27	M = 10.17

* Significant at .05 level

Table 4.7

MEAN TOTAL NES-NAI SCORES (1965)
BY ACHIEVEMENT STATUS (1967)
FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 74.43	M = 76.60	M = -2.17	M = 74.74
Manitowoc, Wis.	S.D. = 3.33	S.D. = 3.78		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 72.90	M = 74.60	M = -1.70 ~~-2.51~~	M = 73.75
Madison, Wis.	S.D. = 2.42	S.D. = 3.13		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M = 72.38	M = 75.07	M = -2.69*	M = 73.68
	S.D. = 2.92	S.D. = 3.43		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 74.45	M = 75.36	M = -.91	M = 74.92
	S.D. = 3.02	S.D. = 3.29		
Regina School	N = 13	N = 23		N = 36
Albuquerque,	M = 74.38	M = 73.87	M = +.51	M = 74.05
New Mexico	S.D. = 3.01	S.D. = 3.28		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 74.43	M = 76.87	M = -2.44**	M = 75.25
Miami, Florida	S.D. = 3.28	S.D. = 3.46		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 74.79	M = 77.22	M = -2.43*	M = 75.38
Louisiana	S.D. = 2.91	S.D. = 2.95		
Emanual Hospital	N = 85	N = 21		N = 106
Portland, Oregon	M = 74.91	M = 75.57	M = -.66	M = 75.04
	S.D. = 3.24	S.D. = 3.11		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 74.44	M = 75.78	M = -1.34**	M = 74.87

* Significant at .05 level
** Significant at .01 level

Table 4.8

MEAN V-1 ("FAKE GOOD") NES-NAI SCORES (1965)
BY ACHIEVEMENT STATUS (1967)
FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status					School Means
	In School	-	Not in School	=	Difference	
Holy Family	N = 30		N = 5			N = 35
Hospital	M = 24.03		M = 21.60		M = +2.43	M = 23.68
Manitowoc, Wis.	S.D. = 5.44		S.D. = 8.44			
Madison General	N = 10		N = 10			N = 20
Hospital	M = 24.20		M = 20.50		M = +3.70	M = 22.35
Madison, Wis.	S.D. = 4.54		S.D. = 4.06			
Henry W. Bishop	N = 16		N = 15			N = 31
Pittsfield, Mass.	M = 26.38		M = 21.87		M = +4.51*	M = 24.20
	S.D. = 4.87		S.D. = 4.81			
Lutheran Hospital	N = 29		N = 11			N = 40
Cleveland, Ohio	M = 22.93		M = 23.82		M = -.89	M = 23.17
	S.D. = 3.66		S.D. = 5.27			
Regina School	N = 13		N = 23			N = 36
Albuquerque,	M = 24.15		M = 23.26		M = +.89	M = 23.58
New Mexico	S.D. = 5.40		S.D. = 4.31			
Jackson Memorial	N = 105		N = 53			N = 158
Hospital	M = 23.82		M = 21.18		M = +2.64**	M = 22.93
Miami, Florida	S.D. = 5.17		S.D. = 5.53			
Mercy Hospital	N = 28		N = 9			N = 37
New Orleans,	M = 24.32		M = 21.44		M = +2.88*	M = 23.62
Louisiana	S.D. = 4.55		S.D. = 6.11			
Emanuel Hospital	N = 85		N = 21			N = 106
Portland, Oregon	M = 22.66		M = 22.71		M = -.05	M = 22.67
	S.D. = 4.38		S.D. = 4.86			
Combined School						
Achievement	N = 316		N = 147			N = 463
Status Means	M = 23.65		M = 21.98		M = +1.67**	M = 23.12

* Significant at .05 level
** Significant at .01 level

Table 4.9

MEAN V-2 ("FAKE POOR") NES-NAI SCORES (1965)
BY ACHIEVEMENT STATUS (1967)
FOR 463 STUDENTS AT 8 SCHOOLS OF NURSING

Nursing Schools	Achievement Status			School Means
	In School -	Not in School =	Difference	
Holy Family	N = 30	N = 5		N = 35
Hospital	M = 9.13	M = 13.00	M = -3.87	M = 9.68
Manitowoc, Wis.	S.D. = 4.20	S.D. = 3.67		
Madison General	N = 10	N = 10		N = 20
Hospital	M = 7.10	M = 9.30	M = -2.20	M = 8.20
Madison, Wis.	S.D. = 3.60	S.D. = 1.77		
Henry W. Bishop	N = 16	N = 15		N = 31
Pittsfield, Mass.	M = 7.69	M = 8.93	M = -1.24	M = 8.29
	S.D. = 3.55	S.D. = 3.69		
Lutheran Hospital	N = 29	N = 11		N = 40
Cleveland, Ohio	M = 8.38	M = 8.64	M = -.26	M = 8.45
	S.D. = 2.76	S.D. = 1.86		
Regina School	N = 13	N = 23		N = 36
Albuquerque,	M = 6.85	M = 7.96	M = -1.11	M = 7.56
New Mexico	S.D. = 3.36	S.D. = 3.23		
Jackson Memorial	N = 105	N = 53		N = 158
Hospital	M = 8.19	M = 9.83	M = -1.64**	M = 8.74
Miami, Florida	S.D. = 3.53	S.D. = 3.97		
Mercy Hospital	N = 28	N = 9		N = 37
New Orleans,	M = 8.82	M = 11.56	M = -2.74*	M = 9.49
Louisiana	S.D. = 2.78	S.D. = 2.46		
Emanuel Hospital	N = 85	N = 21		N = 106
Portland, Oregon	M = 9.47	M = 9.29	M = +.18	M = 9.43
	S.D. = 3.33	S.D. = 3.77		
Combined School				
Achievement	N = 316	N = 147		N = 463
Status Means	M = 8.58	M = 9.46	M = -.88**	M = 8.86

* Significant at .05 level
** Significant at .01 level

Table 4. 10

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES AT HOLY FAMILY HOSPITAL SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	2. 81	. 18	6. 38*	. 60	. 03	. 27	1.75	.73	3.73
Residual	33	(1. 23)	(3. 18)	(. 91)	(1. 13)	(1. 29)	(1. 11)	(11.47)	(34.67)	(17.14)
Total	34									

* Significant at . 05 level
** Significant at . 01 level

Table 4. 11

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES AT MADISON GENERAL HOSPITAL SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	1. 38	. 34	. 04	. 14	. 47	2. 31	1.84	3.68	3.00
Residual	18	(1. 30)	(1. 34)	(1. 38)	(1. 39)	(. 96)	(. 78)	(7.85)	(18.56)	(8.06)
Total	19									

Table 4.12

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES
AT HENRY W. BISHOP SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	.09	3.77	2.42	.73	.24	.86	5.56*	6.72*	5.56*
Residual	29	(1.68)	(2.83)	(1.10)	(2.11)	(1.10)	(1.43)	(10.09)	(23.43)	(13.11)
Total	30									

* Significant at .05 level

Table 4.13

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES
AT LUTHERAN HOSPITAL SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	.43	.04	.05	.42	.11	.49	.70	.37	.08
Residual	38	(1.09)	(2.89)	(1.45)	(1.92)	(1.10)	(1.13)	(9.57)	(17.20)	(6.51)
Total	39									

Table 4.14

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES AT REGINA SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	2.97	.41	.48	.05	.84	.00	.21	.30	.95
Residual	34	(1.05)	(3.05)	(1.43)	(1.67)	(1.18)	(1.11)	(10.17)	(22.30)	(10.73)
Total	35									

Table 4.15

F RATIOS AND RESIDUAL ERROR FROM ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES AT JACKSON MEMORIAL SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	2.26	16.95**	2.31	.75	.01	5.53*	18.81**	8.70**	6.98**
Residual	156	(1.24)	(3.09)	(1.21)	(2.03)	(1.04)	(1.18)	(11.14)	(28.00)	(13.57)
Total	157									

* Significant at .05 level

** Significant at .01 level

Table 4. 16

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES
AT MERCY HOSPITAL SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	4.83*	1.67	.24	2.59	.23	.01	4.74*	2.30	6.95*
Residual	35	(.58)	(2.83)	(1.07)	(2.47)	(.86)	(1.34)	(8.52)	(24.52)	(7.32)
Total	36									

* Significant at .05 level

Table 4. 17

F RATIOS AND RESIDUAL ERROR FROM
ANALYSES OF VARIANCE OF AREA AND TOTAL NES-NAI SCORES
AT EMANUEL HOSPITAL SCHOOL OF NURSING (1965)

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Treatment	1	.73	.03	.10	1.68	.51	.86	.72	.01	.05
Residual	104	(1.20)	(2.42)	(1.22)	(1.96)	(1.07)	(1.11)	(10.35)	(20.03)	(11.71)
Total	105									

Table 4.18

F RATIOS AND ERROR MEAN SQUARES FROM ANALYSES OF VARIANCE OF NES-NAI SCORES AT EIGHT SCHOOLS OF NURSING

Source	df	Nursing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Nursing School	7	1.32	2.57**	.73	1.41	1.11	3.60**	2.26*	.77	2.81**
Achievement Status	1	10.35**	8.23**	4.51*	4.72*	.01	2.62	22.83**	11.17**	12.91**
Nursing School x Achievement Status	7	.43	1.95	.90	.48	.35	.85	1.31	1.35	1.16
Error Mean Square	447	(1.18)	(2.81)	(1.22)	(1.92)	(1.07)	(1.16)	(10.37)	(24.34)	(11.84)

* Significant at .05 level
** Significant at .01 level

Table 4.19

SUMMARY OF NES-NAI-AREA, VERIFICATION, AND TOTAL SCORES (1965) DIFFERENTIATING (.05 LEVEL OR GREATER) STUDENTS ENROLLED FROM STUDENTS NO LONGER ENROLLED AFTER TWO YEARS (1967) AT EIGHT SCHOOLS OF NURSING

	NES-NAI Scales								
Nursing Schools	Nurs-ing	Self	Home-Family	Resp.	O-L-M	Acad.	Total	V-1	V-2
Holy Family Manitowoc, Wis.			.05						
Madison General Madison, Wis.									
Henry W. Bishop Pittsfield, Mass.							.05	.05	
Lutheran Hospital Cleveland, Ohio									
Regina School Albuquerque, N. M.									
Jackson Memorial Miami, Florida		.01				.05	.01	.01	.01
Mercy Hospital New Orleans, La.	.05						.05		.05
Emanuel Hospital Portland, Oregon									
Combined	.01	.01	.05	.05			.01	.01	.01

Table 4.20

ADMISSION NES-NAI TOTAL SCORES (1965) BY ACHIEVEMENT STATUS OF STUDENTS (1967) AT 8 SCHOOLS OF NURSING

NES-NAI Total	Holy Family		Madison General		Henry W. Bishop	
Scores	In School	Not in School	In School	Not in School	In School	Not in School
85	0	0	0	0	0	0
84	0	0	0	0	0	0
83	0	0	0	0	0	0
82	0	0	0	0	0	0
81	0	1	0	0	0	1
80	2	1	0	1	0	1
79	0	0	0	0	0	0
78	2	0	0	1	0	3
77	5	0	0	1	0	0
76	2	0	1	0	1	0
75	7	2	2	2	2	3
74	3	0	2	2	5	2
73	1	0	1	0	2	2
72	3	1	1	1	1	2
71	1	0	2	1	1	0
70	1	0	0	1	2	0
69	1	0	0	0	0	0
68	1	0	1	0	1	1
67	0	0	0	0	0	0
66	1	0	0	0	0	0
65	0	0	0	0	1	0
	N=30	N=5	N=10	N=10	N=16	N=15

NES-NAI Total	Lutheran		Regina		Jackson Memorial	
Scores	In School	Not in School	In School	Not in School	In School	Not in School
85	0	0	0	0	0	1
84	0	0	0	0	0	1
83	1	0	0	0	1	2
82	0	0	0	0	1	0
81	0	0	1	0	2	2
80	0	1	0	0	4	6
79	1	1	0	1	4	3
78	2	2	1	1	7	8
77	0	0	0	4	10	9
76	7	2	1	2	5	1
75	4	1	4	2	19	8
74	3	0	1	4	8	3
73	4	2	1	3	13	3
72	3	0	3	1	9	3
71	1	1	0	2	9	1
70	1	1	0	0	9	1
69	2	0	1	1	1	1
68	0	0	0	1	3	0
67	0	0	0	0	0	0
66	0	0	0	1	0	0
65	0	0	0	0	0	0
	N=29	N=11	N=13	N=23	N=105	N=53

Table 4. 20 (continued)

ADMISSION NES-NAI TOTAL SCORES (1965) BY ACHIEVEMENT STATUS OF STUDENTS (1967) AT 8 SCHOOLS OF NURSING

NES-NAI Total	Mercy Hospital		Emanuel Hospital		Eight Schools Combined	
Scores	In School	Not in School	In School	Not in School	In School	Not in School
85	0	0	0	0	0	1
84	0	0	1	0	1	1
83	0	1	1	0	3	3
82	0	0	1	0	2	0
81	0	1	0	0	3	5
80	0	0	3	0	9	10
79	4	0	5	2	14	7
78	2	0	7	4	21	19
77	2	3	11	4	28	21
76	1	1	4	4	22	10
75	5	2	11	1	54	21
74	8	1	8	2	38	14
73	2	0	14	1	38	11
72	1	0	9	1	30	9
71	0	0	5	1	19	6
70	2	0	3	0	18	3
69	0	0	0	0	5	2
68	0	0	1	0	7	2
67	1	0	1	0	2	0
66	0	0	0	1	1	2
65	0	0	0	0	1	0
	N=28	N=9	N=85	N=21	N=316	N=147

Chapter 5

Empathy Inventory*

Empathy

Among the dimensions of attitudes and behavior, the concept of "empathy" is probably an important but neglected variable which should be studied in relation to the effectiveness of nursing school faculty members. Empathy may be defined as "the imaginative projection of one's own consciousness into another being" or in effect "I see how you feel". Downey defined empathy thus: "Through subtle imitation we assume an alien personality, we become aware of how it feels to behave thus and so, then we read back into the other person our consciousness of what his pattern of behavior feels like" (1929, p. 177). Gardner Murphy described empathy as "experiencing within oneself what actually belongs to other perceived persons or objects" (1947, p. 496). Individuals differ in their ability to empathize with others and these differences appear to be related to their ability to understand and teach others. Combs (1965) suggested that "a false or inaccurate conception of what his students are like provides the teacher with an inadequate basis for making decisions and directing the learning process".

Kerr (1947) developed an instrument called the Empathy Test and carried out numerous reliability and validity studies with it. Performance on the Empathy Test (Kerr, 1947) was found to be related to functioning in industry (Van Zelst, 1953), sales (Tobalski and Kerr, 1952), and clinical practice (Alden, 1954).

The content of empathy measures in other fields has varied widely. Livensparger (1965) used items from the Strong Vocational Interest Blank; Chance and Meaders from the Edwards Personal Preference Schedule; Rodgers (1959), from Gough's Adjective Check List; Dymond (1949) from the MMPI. Strayer (1960) obtained six different empathy measures by the use of a test of knowledge, a job rating, and a sociometric rating.

Dixon and Morse (1961) developed a theoretical rationale for empathy as a predictor of teaching performance. They defined empathy as involving two functions: (1) the ability to intellectually perceive how another person will respond, and (2) a highly accepting relationship between student and teacher marked by positive feelings toward one another. The latter they regard as the important element of empathy. Results from their research indicate that the teacher's level of empathy is related to students' ratings of his ability as a teacher, to his self-concept as a teacher, but is not related to several personality dimensions which were hypothesized to be correlates of empathy.

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*An edited form of this chapter appeared as an article: Brunclik, H. L., Thurston, J. R., and Feldhusen, J. F. "Empathy Inventory," Nursing Outlook, 1967, 15, 42-45.

The Purpose of This Study

The part of Phase III research dealing with empathy was concerned with evaluating the test-retest reliability of the Empathy Inventory. Empathy was defined as the ability to know what students consider to be preferred responses in the area of attitudes and emotional reactions. Substantial understanding of a student's attitudes and perceptions is probably influential in determining the nature of faculty-student relationships -- and hence students performance -- in the classroom, on the hospital ward, and in casual encounters as well as in formal counseling sessions.

In addition, individual differences in empathic ability among faculty members probably affect interactions among instructors and this constitutes a factor contributing to the overall psycho-social climate of the school another of the precipitating factors suggested previously. It seems reasonable to hypothesize that faculty members who lack understanding of their students might also lack understanding of their fellow instructors and thus encounter more interpersonal difficulties in relationships with them. Such difficulties would in turn probably have an adverse effect on student achievement.

Empathy Inventory Development

In connection with the development of the Nurse Attitudes Inventory (Thurston and Brunclik, 1965), an extended investigation was made into the types of completions that a nursing student believes an applicant should make in response to sentence stems if the applicant were interested in creating a favorable impression ("faking good") on the admissions committee of a nursing school. (See Chapter 1 for a detailed account of this approach.) The purpose of that inquiry was to develop information which could be used to 1) prevent this "faking" tendency in choosing the NAI multiple choice foils, and 2) taken into consideration in evaluating the results of this attitude inventory. In the course of this analysis, it became clear that these data could also be used in the development of an inventory for exploring differences in empathic ability among faculty members.

In choosing stems and completions for the Empathy Inventory, the only completions used were those which were at least two mean ranks apart, e.g., 7.4 and 5.3, 6.8 and 4.4, 2.5 and 5.3. In other words, those completions selected had been accorded ranks by nursing students which were quite different from one another. One completion was ranked much higher than the other by students in terms of its making a favorable impression on a nursing faculty.

Of the 140 sentence stems, seventy-five were selected for the Empathy Inventory. The avoidance of duplication of stems as well as lack of variation in "faking good" rankings among some completions were prime considerations in this selection. The scoring key for the Empathy Inventory is based on "correct" answers which in each case is the one with the lower mean rank, the sentence completion indicated by nursing students as the one an applicant should pick if she wished to make a good impression on a nursing school admissions committee. The following are three items from the Empathy Inventory.

When I go to nursing school, my family will . . . .
  a. miss me
  b. have extra expense
Other people think of me as . . . .
  a. the girl with a lot of pep
  b. being friendly
When a girl doesn't finish nurses training, she . . . .
  a. isn't suited for it
  b. must have a good reason

These excerpts from the instructions indicate what is to be done by the person taking the inventory:

> "You are to put yourself in the place of a student attending a school of nursing. You are given a series of choices involving completions to sentence beginnings. In each instance you are to choose the completion of the two listed which you feel would be selected by this student as the one an applicant to a nursing school should choose if she, the applicant, wanted to show herself off to the best possible advantage."

Norms

Nursing schools in the state of Wisconsin and schools in the Luther Hospital Research Project were given the opportunity to participate in the standardization of the Empathy Inventory. Thirty-five nursing schools cooperated and the majority of faculty members at these schools completed the Empathy Inventory forms. The standardization was restricted to females. Each participating faculty member was promised that her performance would be known only to her. While this "voluntary" approach might have introduced problems of selectivity, there seemed to be no alternative which could afford as complete and representative a sample. Empathy Inventories completed by faculty members were differentiated on the basis of the members' association with an associate degree, diploma, or baccalaureate program.

In order to provide additional standards by which to judge individual performance, the Empathy Inventory was administered to male and female junior and senior university students enrolled in a mental hygiene course, and to female nursing students at a diploma school. The norms established on the basis of this testing are published elsewhere (Brunclik, Thurston, and Feldhusen, 1967).

Test-retest Reliability

Fiedler (1958) reported that measures of empathy have moderate or high reliabilities. In an effort to secure information regarding the test-retest reliability of the Empathy Inventory, the test was given in an anonymous fashion twice to three different graduate level educational psychology classes (N=24, N=42, and N=43). Copies of the Empathy Inventory and answer sheets were distributed to the students who were then told to identify themselves only with some symbol or number. The students were asked to read the instructions silently and carefully while the examiner read them aloud. They were allowed as much time as needed to complete the inventory. There was no indication given at the first session that the Empathy Inventory would be given again.

When the Inventory was given the second time, one week after the first administration, the students were told to reread the instructions silently and proceed. They were also told to use the same identifying symbol or number that they had used the first time.

Correlation coefficients between the first and second administration were calculated. For the group with N=43 the correlation was .79; for the group with N=24, it was .58; for the group with N=42, .61; and for the three groups combined with N=109, the correlation was .70. The coefficients were judged to indicate that the Empathy Inventory was sufficiently reliable for group assessments. However, further analyses of the reliability of the Inventory will be undertaken with a parallel form used for retesting and with a split-half analysis to evaluate internal consistency.

One problem which has been noted in this test-retest reliability analysis is that the groups tested are relatively homogeneous on this trait. This is reflected in low variance in the test scores. McNemar (1962, p. 152) points out that reliability estimates are inevitably lowered when the variance of the test scores is low. Thus, it seems likely that estimates of the reliability of the Empathy Inventory will be higher when the group tested is more heterogeneous on the behavior measured.

Possible Uses

For the present the major use of the Empathy Inventory should be in research which explores its reliability and validity for various purposes in nursing education. The Empathy Inventory should have potential for use in a number of nursing education functions. The interested faculty member might wish to take the Empathy Inventory to assess her own empathy with students -- as defined by the test -- in comparison with other nursing school faculty members. The nursing school might wish to utilize the test an an in-service teaching device or, pending affirmative research findings, for the assignment of counseling responsibilities to faculty members. As indicated previously, the Empathy Inventory might be a useful tool in exploring the role of individual faculty members and/or schools in the precipitation of underachievement, withdrawal and failure of nursing students. In his review of research on college teaching, McKeachie (1963, p. 157) concluded that when an instructor is aware of individual differences among students his teaching improves.

Certainly it seems likely that discernment of the student point of view may be an important factor affecting the success of nursing instructors in their efforts to help students learn. Studies of instructor effectiveness have often attempted some kind of global evaluation of the instructor. Newer concepts of teaching are likely to stress the multiple or complex nature of teaching and its outcomes.

Thus, it may be necessary to try to determine which aspects of instructor behavior and what kinds of learning may be affected by the instructor's ability to empathize. The faculty member's empathic ability would seem to be related to her capacity for counseling students regarding personal and educational problems; understanding the motives, attitudes, and reactions of individual students as a guide to individualizing instruction; establishing rapport with a whole class in order to motivate them to learn the subject matter; and producing learning of good attitudes toward desirable nursing practices.

Much research will be needed to establish the relationship of Empathy Inventory performance by nursing instructors to those and other aspects of teaching and counseling in a nursing school. While the results of such research could be uniquely useful to nursing schools in relation to problems of selection, training and in-service education of nurses, the methods used and results obtained could also have important implications in other areas of instruction and in teacher education.

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Chapter 6

Summary of the Special Study
Involving Purdue University's Five Associate Degree Nursing Programs: Prediction of Course Grades and Semester Averages With Cognitive, Affective and Biographical Variables

Most of the research on the problems of nursing student success or failure has used single tests or indexes as predictors of global measures of performance such as achievement, failure, or withdrawal. This tendency has represented an oversimplified approach to a very complicated problem as Fulkerson and Barry (1961, p. 191) pointed out: "... prognosis research seems to require a more complex, mathematical model, and thus a more complex research design, than has been generally used so far. Specifically, the one-stage design, where a predictor is correlated with an outcome measure, would appear inadequate in this field." One important consequence of this approach to the problem is that the research has almost invariably stopped far short of specific predictions concerning individuals.

Predictions of overall grade-point averages or graduation status have also been common. However, in a recent review of research on prediction of academic performance, Lavin (1965) noted some small trend toward the differential prediction technique which involves the use of special batteries of predictors for particular courses or tests. Thus, for example, the researcher may use ten or more predictor variables in an attempt to predict performance in a specific course such as obstetric nursing.

In addition, the knowledge generated from prediction research has been viewed typically in restricted, short range terms. Characteristically the eventual application has stressed improvement in selection procedure for applicants. There has been little emphasis placed on the value of such knowledge in assisting individual students who have entered nursing education programs, for whom failure or low performance in a specific course is predicted, and for whom some remedial or preventive action should be taken.

Perhaps the most troublesome aspect of research on the prediction of academic performance has been the selection of predictor variables. In a review of research on nursing education, Taylor (1963), concluded that the best predictors of academic success in nursing education are high school and college grades and the scores on tests specifically designed for selection of nursing students such as the NLN Pre-Nursing and Guidance Examination and the Psychological Corporation Entrance Examinations. Taylor concluded from this review that the personality assessment techniques currently available can add little to the prediction of achievement. Munday and Hoyt (1965) used the American College Tests (ACT) and high school grades to predict achievement. Their multiple correlations ranged from .31 to .78 for specific courses. In addition, they concluded that inter-school differences are so great that it is difficult to generalize about prediction procedures from one nursing school to another.

While most of the studies on prediction of academic performance have focussed on ability measures as predictor variables, Yonge (1965) concluded from his review of research in this area that there is a noticeable trend away from exclusive use of ability measures to various other kinds of predictors. A review of research in several areas of the behavioral sciences indicates that achievement in colleges and nursing schools is related to the following kinds of variables (references to primary or review sources are given for each area):

Personality. Thurston and Brunclik, 1965b; Lavin, 1965; Taylor, 1963.

Socio-economic and biographical data. Hollingshead and Redlich, 1958.

Anxiety. Ruebush, 1963; Denny, Paterson, and Feldhusen, 1964; Lavin, 1965.

Measures of prior learning. Fein, 1963; Taylor, 1963; Gagne' and Paradise, 1961; Lavin, 1965.

Aptitudes. Lavin, 1965; Taylor, 1963.

Creative thinking ability. Torrance, 1962; Torrance, 1964; Guilford, 1959; Stolurow, 1961; Wilson, 1965; Miller, 1962.

The Problem

The review of research provided the basis for selecting variables to be evaluated as correlates of success in nursing education. Specifically, ability and affectivity tests and biographical variables were used as measures of student characteristics which were to be related to their academic performance in nursing school. The ultimate aim was to discover which variables, either singly or in combination, could predict overall achievement as reflected in semester grade-point averages and difficulties in specific courses and areas of instruction for specific students. Such information could alert counselors and teachers as to which students would be expected to encounter which kinds of problems, thereby enabling them to assist the students in these areas before they encounter problems of such magnitude that they resist effective remedy.

The specific questions asked in this research are as follows: (1) What degree of accuracy can be achieved in the prediction of course grades? (2) What are the levels of multiple correlation between 26 student predictor variables and criterion measures in the form of semester and cumulative grade-point indexes? and (3) Do three creative thinking ability measures contribute a significant increment to the multiple correlation of the 26 student variables with the semester and cumulative grade point indexes?

Method of Procedure

Freshmen who entered the Purdue University associate degree program of nursing education in 1964, 1965, and 1966 served as subjects in this study. In 1964 programs were in operation at Purdue's Lafayette and Fort Wayne campuses;

in 1965 new programs began operation at Hammond and Indianapolis; and in 1966 a program was started in Michigan City. Information regarding aptitudes and academic performance together with data on the occupational and educational status of the parents were gathered from available records. The following data were obtained within the first month after admission:

1. Personality. The Nursing Sentence Completions (NSC) consists of 40 stems designed specifically for the evaluation of the attitudes and emotional reactions of nursing students. The NSC is scored with the Nursing Education Scale (Thurston and Brunclik, 1965a).
2. Socio-economic and biographical data. Educational and occupational status of the student's father and mother; the student's age upon admission to the nursing program; and the student's educational level as the number of years of school completed prior to admission to nursing.
3. Anxiety. The Taylor Manifest Anxiety Scale (Taylor, 1953) and the Test Anxiety Scale (Sarason, 1961).
4. Measures of prior learning. The rank of the student in her high school graduating class and the student's academic averages for high school courses in English, mathematics, and science and the total for the three areas of course work.
5. Aptitudes. The Scholastic Aptitude Test (SAT) verbal and mathematics scores; two tests of short-term memory from the Kit of Reference Tests for Cognitive Factors (French, Ekstrom, and Price, 1963).
6. Creative Thinking Ability. Alternate uses, a test of the divergent thinking function of spontaneous flexibility (Guilford, 1959); Consequences, a test of the divergent thinking functions of ideational fluency and originality (Guilford, 1959).
7. Creativity Self Rating. A 67-item creativity self-rating scale (Feldhusen, 1965) which yieldsseven subscores as follows:
    (a) The scores for total number of self-descriptive items checked from the total of 67 items (C-R A's).
    (b) The factor one of the scale - 25 items which are a measure of socially-conforming creativity self-image (C-R 1).
    (c) The factor two of the scale - 17 items which are a measure of socially-nonconforming creativity self-image (C-R 2).
    (d) The factor three of the scale - 20 items which are a measure of dynamics, energetic aspects of creative self-image (C-R 3).
    (e) The factor four of the scale - 9 items which are a measure of diffident creative self-image (C-R 4).
    (f) A score for eleven items which were found, in another sample of 325 S's, to be highly correlated with an independent measure of fluency as an ability (C-R Fluency).
    (g) A score for 19 items which were found, in the other sample of 325 S's, to be highly correlated with an independent measure of flexibility as an ability (C-R Flexibility).

Table 6.3 gives a complete summary of the 29 student variables derived from tests and cumulative records.

Criteria of Performance in Nursing School

The learning criteria were of two types. The first criteria were the following course grades:

(1) First Semester Biology
(2) Introduction to Nursing
(3) First Semester Chemistry
(4) Nutrition

The second type of learning criteria were the students' overall semester and cumulative grade-point averages for each of the four semesters of the program.

Statistical Procedures

Three types of statistical procedures were used to analyze the data. First, for the analyses involving course grades a discriminant function analysis was used (Cooley and Lohnes, 1962) in which grades in the four courses were to be predicted using twenty predictor variables (the maximum number of variables which could be used with the computer program available). The twenty predictors and the four course grade criteria are given in Table 6.1. The discriminant analysis was used for the course grades because of their categorical nature. That is, their numerical value equivalents do not necessarily constitute a continuous variable of equal intervals. The discriminant function also takes advantage of non-linear relationships between predictors and criterion variables.

Discriminant analyses were run using data on 1964, 1965, and 1966 entrants. A cross-validation of these analyses with 1967 entrants is also planned but was not possible at the present since a cross-validation program is not available for the computer which was used to process data in this research.

The data for semester and cumulative grade-point averages were analyzed with a weighted regression analysis program using 26 predictor variables as shown in Table 6.2. The computer program used in this analysis was a stepwise procedure which used the tear-down method of analysis. In the first step, a multiple correlation is calculated for the predictor variables (X's) with the criterion measure (Y). In this study, examples of the X's are students' high school averages, ranks of students in their high school class, anxiety scores, and creativity measures. The Y's are the grades in courses and grade point averages in nursing school. In essence, the analysis takes the form of selective removal from the group of predictor variables (X's) those which contribute least to the multiple correlation with the criterion measure (Y). This selective process ceases when an optimum level has been reached at which all remaining variables make significant contributions to the multiple correlations (McNemar, 1965).

Multiple correlations of the type described above were calculated for seven semester averages using 1964 and 1965 entrants as a validation sample to derive the prediction coefficients. In the cross-validation analyses, the coefficients derived from the 1964 and 1965 entrants for the variables which were significant predictors, were applied to the same variable scores on the 1966 sample to derive a predicted semester average. The predicted semester averages were then correlated with the observed 1966 semester averages.

A third type of analysis was also used for a further analysis of the data on 1964 and 1965 entrants. This consisted of the same weighted regression analysis program which was described above with the addition of three creativity test scores to the matrix of predictors (thus, a total of 29 predictors) but without the cross-validation on 1966 entrants. The purpose of this analysis was simply to identify the level of multiple correlation and the significant predictors in a set of variables which included three creative thinking ability measures which could not be included in the second type of analysis described above. The creativity ability measures were not obtained in 1966 and hence could not be used in the cross-validation.

Results

The results derived from the discriminant analyses are given in Table 6.1. The predictor variables are listed in the continuation of the table. The Mahalanobis D^2 (Dixon, 1965) can be used as a chi-square with 80 degrees of freedom to test the hypothesis that the mean values are the same in all five groups for these 20 variables. The D^2 for each of the four courses is significant beyond the .005 level. Thus, while the computer program used does not provide a test of significance for each of the twenty predictor variables, it is reasonable to conclude that all or some of the means for the twenty variables by five groups differ significantly.

The prediction table presented for each course is an evaluation of the accuracy of prediction when the function is applied to the sample from which it is derived. Presumably shrinkage or less accurate prediction would occur if it were applied to a cross-validation sample.

The prediction table for the Biology course grades shows the number of correct predictions at each grade level and the percentage of correct predictions in parentheses. The total number of grades given at each level and the percentage that this is of the total are given in the last column of the table. The latter, the percentage, is an index of the number of predictions for the grade level which would be correct by chance.

Thus, for the Biology grades at the A level, 12 grades were predicted correctly, and this represents 80 percent accuracy. By chance alone one would expect only about five percent correct predictions. At level F 70 percent correct prediction is achieved whereas by chance alone one would expect a correct prediction of only nine percent. If D's and F's were combined into a single category for the group who received F's, the accuracy of prediction would be 89 percent. If A's and B's were combined, the accuracy would be 93 percent. In the middle range of grades received, B to D, the accuracy is much lower, sometimes below the chance level. For example, by chance one would expect

42 percent of C's correctly predicted while with the function only 27 percent are correctly predicted.

For the Introduction to Nursing course prediction of A's is 64 percent accurate whereas by chance 14 percent accuracy of predictions would be expected. For F's the accuracy is 77 percent and if D's and F's were combined the percentage of correct predictions would be 92 percent.

Prediction of Chemistry course grades reveals that 66 percent of A's are correctly predicted but only 52 percent of F's are predicted correctly. If the D and F categories are combined for people who received F's, the accuracy of prediction is 76 percent.

Prediction of nutrition grades is highly accurate for the A's but poor for F's. Seventy-seven percent of A's are correctly predicted, but only 22 percent of F predictions are correct.

The results for the regression analyses are given in Table 6.2. The set of 26 predictor variables is given at the bottom of the table. The multiple R for each of the semester and cumulative indexes is given in the first row, the R^2 in the second row, (R^2 is an estimate of the percentage of variance accounted for above the chance level) the standard error of the criterion in the third row, N for the validation analysis in the fourth row, the identification numbers of the reduced set of significant predictor variables in the fifth row, and the mean for Y in the sixth row. The cross-validation data consists of the r or simple correlation for predicted and observed indexes which is in row seven and the N for the cross-validation sample which is in row eight.

The R's for the validation analyses range from a low of .54 for second semester cumulative graduation index to .65 for third semester graduation index. The variables which appear most frequently as significant predictors in the reduced sets are test anxiety, the creativity self rating of energetic self-image, the educational level attained by the mother, the SAT verbal score, the average high school grades for three subjects combined, and the rank in the high school graduating class. The r's for the three cross-validations range from .54 to .60. All of the validation R's and cross-validation r's are significant at or beyond the .01 level.

The regression analyses for the entire battery of 29 predictor variables are reported in Table 6.3. The R's range higher than for the regression analyses with 26 variables. Here the highest R, for fourth semester cumulative graduation index, is .73 whereas with 26 variables the highest R was .65. The originality variable appears as a significant predictor in three of the reduced sets for third and fourth semesters. Flexibility appears in four sets while fluency appears in only one set. In three instances the multiple R for a battery including one or more creativity measures was significantly greater than the R for a battery which did not include creativity measures, namely for second and fourth semester cumulative indexes and for the fourth semester index.

Summary

This study was designed to investigate an approach which would increase the predictability of failure in nursing education. The research is unique in three respects. First, it is an effort to use ability, personality, and socio-economic variables in a single battery to predict achievement in nursing education. In much of the research in this field, variables have been selected from only one of these three classes of assessment. Second, its ultimate aim is to discover variables which can be used to predict achievement and difficulties in specific courses and specific areas of instruction. Third, the overall plan includes the development of a consultative system with instructors and with students in which data from tests of cognitive and affective variables and biographical data can be used to plan individual programs to prevent predicted academic difficulties or failure. The results attained so far indicate that success and failure in specific courses can be predicted with far greater accuracy than would be expected on a chance basis alone. Second, overall success or failure in a given semester can be predicted with relative accuracy. Third, tests of creative thinking abilities would significantly increase the accuracy of a prediction battery.

This research is designed, then, with an ultimate objective to make it possible for more students who enter nursing education programs to graduate successfully than is currently the case. Little is known about the reactions of students who fail or drop out, but it is assumed that such an unsuccessful end to the program could be psychologically painful and damaging to the student. Thus, it would also be desirable from a humanitarian point of view to prevent unsuccessful termination of programs.

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Table 6. 1

DISCRIMINANT ANALYSIS FOR THE PREDICTION OF COURSE GRADES FOR 1964, 1965, AND 1966 ENTRANTS*

Course	D^2	N	Group Who Received	Prediction Table					
				Predicted Level					
				A	B	C	D	F	TOTAL
			A	12(80)	2	0	0	1	15(5)
	171.61		B	10	31(51)	8	8	4	61(20)
Biology	80 df	311	C	17	31	35(27)	24	23	130(42)
	$P < .005$		D	8	9	10	35(45)	16	78(25)
			F	1	1	1	5	19(70)	27(8)
			A	28(64)	2	7	4	3	44(14)
	140.65		B	30	38(33)	25	11	10	114(37)
Introduction	80 df	310	C	18	19	32(28)	27	18	114(37)
to Nursing	$P < .005$		D	1	0	3	15(60)	6	25(8)
			F	1	0	0	2	10(77)	13(4)
			A	19(66)	6	1	1	2	29(9)
	224.31		B	11	30(49)	6	2	12	61(20)
Chemistry	80 df	304	C	13	24	25(26)	17	19	98(32)
	$P < .005$		D	2	6	8	27(51)	10	53(17)
			F	2	5	8	15	33(52)	63(22)
			A	10(77)	0	1	2	0	13(5)
	206.91		B	15	31(43)	16	9	1	72(25)
Nutrition	80 df	284	C	21	20	70(47)	35	4	150(53)
	$P < .005$		D	3	2	9	25(63)	1	40(14)
			F	1	1	3	2	2(22)	9(3)

* Prediction Variables Used in Matrix

1. Age in months on October 1 of year of admission
2. General Anxiety
3. Test Anxiety
4. C-R Factor 1, Social Conformity Self Image
5. C-R Factor 2, Social Non-conformity Self Image
6. C-R Factor 3, Energetic Self Image
7. C-R Factor 4, Diffidence of Self Image
8. Memory for first names
9. Memory for objects
10. Nursing Education Scale - NSC Total Score
11. Occupation of father
12. Education of father
13. Occupation of mother
14. Education of mother
15. SAT - Mathematics
16. SAT - Verbal
17. Average high school grades in English
18. Average high school grades in mathematics
19. Average high school grades in science
20. Rank in high school graduating class

Table 6.2

VALIDATION AND CROSS VALIDATION REGRESSION ANALYSIS FOR SEMESTER AND GRADUATION INDEXES OF 1964 AND 1965 ENTRANTS

	1st Sem. Index	2nd Sem. Index	2nd Sem. Cum. Ind.	3rd Sem. Index	3rd Sem. Cum. Ind.	4th Sem. Index	4th Sem. Cum. Ind.
R	.61	.56	.54	.56	.65	.56	.55
R^2	.37	.31	.29	.32	.43	.31	.30
S. E.	.61	.64	.70	.56	.43	.64	.56
N	174	154	154	132	132	116	116
Predictor Variables Significant At .80 or Higher	7, 14, 20, 21, 25, 26	13, 19, 20, 22, 23, 24, 25, 26	7, 9, 12, 15, 18, 20, 21, 24, 25	1, 2, 3, 5, 6, 8, 9, 12, 15, 18, 20 22, 24	2, 3, 6, 8 9, 14, 18, 20, 24, 26	1, 3, 7, 10, 13, 15, 16, 17, 18, 19, 22, 24	3, 7, 13, 17, 18, 20, 24, 26
Mean of Y	4.19	4.32	4.25	4.53	4.46	4.65	4.54
r on cross-validation for 1966 Entrants	.60	.56	.54				
N for Cross-validation	151	150	151				

Note: All R's and r's are significant at or beyond the .01 level

Names of the 26 Predictor Variables

1. Age in months on October 1 of year of admission
2. General Anxiety
3. Test Anxiety
4. C-R Total Checks
5. C-R Factor 1
6. C-R Factor 2
7. C-R Factor 3
8. C-R Factor 4
9. C-R Total Score
10. Memory for names
11. Memory for objects
12. Nursing Education Scale - NSC Total Score
13. C-R fluency items
14. C-R flexibility items
15. Occupation of father
16. Education of father
17. Occupation of mother
18. Education of mother
19. SAT - Mathematics
20. SAT - Verbal
21. Average high school grades in English
22. Average high school grades in mathematics
23. Average high school grades in science
24. Average high school grades in all subjects
25. Education level attained prior to Purdue admission
26. Rank in high school graduating class

Table 6. 3

VALIDATION REGRESSION ANALYSIS FOR SEMESTER AND GRADUATION INDEXES FOR 1964 AND 1965 ENTRANTS FOR 29 PREDICTOR VARIABLES INCLUDING GUILFORD CREATIVITY MEASURES

	1st Sem. Index	2nd Sem. Index	2nd Sem. Cum. Ind.	3rd Sem. Index	3rd Sem. Cum. Ind.	4th Sem. Index	4th Sem. Cum. Ind.
R	.62	.59	.64*	.57	.64	.68*	.73*
R^2	.38	.34	.41	.32	.42	.46	.53
S. E.	.60	.61	.50	.56	.44	.60	.50
N	174	149	149	129	129	116	116
Predictor Variables Significant At .80 or Higher	7, 12, 16, 20, 23, 27, 28	11, 16, 22, 23, 25, 26, 27	7, 8, 11, 16, 20, 22, 23, 24, 25, 27, 28	2, 3, 8, 9 10, 15, 18, 21, 22, 23, 27, 28, 29	2, 3, 4, 6, 8, 10, 11, 15, 16, 23, 27, 28, 29	2, 3, 8, 12, 14, 17, 20, 21, 25, 27	2, 3, 8, 10, 11, 13, 14, 17, 21, 23, 25, 29
Mean of Y	4.19	4.31	4.28	4.51	4.45	4.64	4.54

*These R's are significantly greater than the R for the set in which no creative ability measure was used ($P < .01$)

Names of the 29 Predictor Variables

1. Age in months on October 1 of year of admission
2. General Anxiety
3. Test Anxiety
4. C-R Total Checks
5. C-R Factor 1
6. C-R Factor 2
7. C-R Factor 3
8. C-R Factor 4
9. C-R Total Score
10. Creative Ability: Originality
11. Creative Ability: Flexibility
12. Creative Ability: Fluency
13. Memory for names
14. Memory for objects
15. Nursing Education Scale - NSC Total Score
16. C-R Fluency Items
17. C-R Flexibility Items
18. Occupation of father
19. Education of father
20. Occupation of mother
21. Education of mother
22. SAT - Mathematics
23. SAT - Verbal
24. Average high school grades in English
25. Average high school grades in mathematics
26. Average high school grades in science
27. Average high school grades in all subjects
28. Education level attained prior to Purdue admission
29. Rank in high school graduating class

Chapter 7

Summary - Phase III - Year One

Phase III of this research was planned to be a four year program. Inasmuch as research support was forthcoming for only one year, the research objectives (see Chapter 2) could be realized only in part. This chapter will summarize the partial completion of Phase III Specific Aims 1-a, 2-a, and 3-a and the fulfillment of Specific Aim 5. Some tentative conclusions are also possible on the basis of partial realization of Specific Aims 1-b and 2-b. The other research objectives must of necessity await further research.

Nursing Sentence Completions (NSC)

Specific Aim 1-a

To evaluate the efficiency of the NSC in the prediction of success or failure early in the nursing school experience of the students.

Specific Aim 2-a

To develop attitudinal area scores for the NSC. Scores would describe the individual student's test performance in terms of similarity to successful or unsuccessful student performance in the following attitudinal areas: 1) Nursing, 2) Self, 3) Others, Love, and Marriage, 4) Home and Family, 5) Responsibility, and 6) Academic Studies.

Specific Aim 3-a

An evaluation of the NES-NSC total and area scores at each school in addition to overall evaluation of Specific Aims 1-a and 2-a.

Discussion

The NSC is comprised of those LHSC sentence stems which elicited responses differentiating achievement levels in nursing education (See Chapter 1). The Nursing Education Scale (NES) was developed to provide for quantified scoring of the LHSC and the NSC as a means of predicting success in schools of nursing. The relationship of NES-LHSC scores to achievement status has been found to be significant and substantial for the schools (Luther, Holy Family) which served in the NES derivation (Thurston, Brunclik, and Feldhusen, 1967). At that time it was determined that the relationship of the attitude area scores to achievement strongly supported the use of the LHSC in identifying specific areas of psychological strength and weaknesses in a student as they might pertain to success in nursing education. The strength of this relationship was such that operational, predictive use of the LHSC could be recommended at these schools. The results at Madison General indicated both the potential of the LHSC as well as the need for caution in its use. While a relationship was established between LHSC performance in this school, it was not as strong as that noted at the other schools. In view of the inter-school differences noted in previous research (Thurston and Brunclik, 1965), it was suggested that the psychological instruments used for prediction of success in nursing education might have to undergo "corrections" or even "custom-making" for the specific schools or types of schools in which they were to be used.

Phase III was addressed in part to determining to what extent the judgments regarding the LHSC would hold true for the NSC and in part to a further study of inter-school differences in NES effectiveness. A significant relationship between achievement status and NES-NSC Total Scores was demonstrated when all schools were considered together. However, significant relationships involving NES-NSC Total Score were shown at only two of the schools when they were considered individually. Similarly it was noted that significant relationships were reported for four of the six area scores (Nursing, Self, Responsibility, and Others-Love-Marriage) when considering all schools combined. Again these relationships were not noted with consistency when evaluated at individual schools nor from year to year at the same school.

Attempts were made to assess the ability of NES-NSC scores to discriminate the students who failed to graduate or remain with their class for academic, personal, or other reasons. This was done in the face of the acknowledged difficulty of determining with exactitude the reasons for these failures to finish as originally scheduled. No consistent NES-NSC differentiations emerged among the categories established for this aspect of the investigation.

It may be concluded that the NSC like the LHSC elicits responses that are related generally to success or failure in nursing education. It would appear however, that there is considerable variation in the magnitude of this relationship from one school to another, and to a lesser degree within one school from time to time. The reasons for this variation might be ascertained through future research. Differences in the psycho-social climate of nursing schools would seem to be one area for exploration in this regard. Individual differences in empathic ability among faculty members might affect interactions among instructors and this could have an impact upon the psycho-social climate. Significant changes in the status or leadership of the school, such as the possibility that it might lose accreditation and/or close, or a change in director, might constitute other influences which might interfere with or obscure the relationship or LHSC or NSC performance to student success.

Individual schools in research involving NES-NSC scoring might also discover which of the attitudinal areas predict achievement within their programs and which ones do not, e.g. "proper" attitudes regarding academic matters may be highly related to success at one school and much less so at another. Aside from the potential significance of such findings in the counseling of individual students, this information might provide the bases for modifications in overall school philosophy and policy. The potential predictive use of these scores in combination with measures of intelligence and achievement by means of "discriminant function" has been detailed elsewhere (Thurston, Brunclik, and Feldhusen, 1967). Utilization of this statistical technique allows specific predictions of student success or failure.

Schools interested in using NES-NSC scores for screening-admission purposes would be advised to proceed with utmost caution in this regard.

Research should be undertaken to ascertain the predictive effectiveness of these scores at the individual schools contemplating their use for this purpose.

Schools would be advised to employ with discretion in their use of NES-NSC scores *per se* to identify the students most likely to experience personal difficulty in nursing school. All things considered, however, it would appear justifiable to use NES-NSC scores in a tentative guide for such identification. These scores could be used in concert with a qualitative analysis of individual NSC responses provide a basis for intervention and attempts at the alleviation and remediation of her problems. This approach as described earlier in this chapter would have particular significance to a nursing school having only a limited amount of professional counseling or faculty counseling time available.

Empathy Inventory (EI)

Specific Aim 5

To proceed in the development of the Empathy Inventory (EI) which is to be used with nursing school faculty and counselors. This inventory was conceived of as a research tool to explore the role of individual faculty members and/or schools in precipitating underachievement or withdrawal of nursing students. Final development of the Empathy Inventory would include assessment of test-retest reliability and an exploration of the means by which the validity of these scores could be investigated in the prediction of instructor performance.

Discussion

A preliminary analysis of the test-retest reliability of the Empathy Inventory in this Phase III research revealed that the Inventory was sufficiently reliable for group assessments.

Nurse Attitudes Inventory (NAI)

Specific Aim 1-b

To evaluate the efficiency of the NAI in the prediction of success or failure early in the nursing school experience of the students.

Specific Aim 2-b

To develop attitudinal area scores for the NAI. Scores would describe the individual student's test performance in terms of similarity to successful or unsuccessful student performance in the following attitudinal areas: 1) Nursing, 2) Self, 3) Others, Love, and Marriage, 4) Home and Family, 5) Responsibility, and 6) Academic Studies.

Specific Aim 3-a

An evaluation of the NES-NAI total and area scores *at each school* in addition to the overall evaluation of Specific Aim 1-b and 2-b.

Discussion

It would seem that many of the recommendations emphasized in the preceding chapter for NES-NSC scores could be echoed here. Relationships have been established between NES-NAI Total and Area score and success in nursing education at several schools. While there was not the opportunity to evaluate year by year changes within a single school, inter-school differences in the strength of these relationships were again noted. The relationship of NES-NAI scores to categories describing the reasons for the students' withdrawal or failure was again evaluated. No consistent pattern of score differences among the categories emerged from this analysis.

It is believed that the NAI can be used most advantageously for research purposes as opposed to operational use at this time.

If the NAI is to be utilized operationally in the early identification of students likely to encounter trouble, it would seem that this must be preceded by study aimed at describing the predictive effectiveness of the NAI at the school considering such usage. The ease of administration and scoring of this instrument constitute marked advantages.

Specific Aim 3 (See Chapter 2) was designed as an intensive exploration of the possibility to develop local scoring standards. Derivation of special NES scorings for individual schools would constitute an extraordinarily involved and time-consuming procedure. Empirical NAI scores for each school could be developed easily through utilization of a test development service. These special scores deriving from this would be based upon the responses which were found to differentiate successful and unsuccessful students at each school.

The Empirical NAI scores derived on the basis of the performance of one class of students could then be cross-validated on a new, independent class. The scores surviving this cross-validation might then constitute a NAI scoring device which would allow *that* school to make more precise predictions of failure-withdrawal than would be obtained through the usual NES-NAI scoring.

It may be that the NAI could have maximum value when used in conjunction with the NSC or LHSC and other information on students. If the NES-NAI could be relied upon with a degree of certainty to predict failure at a given school, the NSC or LHSC records of the students so designated could be evaluated qualitatively to gather information on the specific nature of potential problems. This would yield more personal information regarding the student than a study of the NAI responses *per se*. If these two tests were used in tandem, it would be best to have the NSC or LHSC administered before the NAI.

One of the most intriguing aspects of the NAI results involves the validations scales. Taking all schools into consideration, the students still in school after two years were more likely to have given "preferred" responses and less inclined to have given "least preferred" responses at the time of their admission than those students no longer in school. These scales may offer evidence bearing upon the motivations of prospective students. Students who were still in school may have wanted to enter school so badly that they were inclined to check those responses they felt were most likely to guarantee their acceptance and to avoid those responses which might jeopardize their positions. On the other hand the students who had not managed to remain in school or who were not proceeding according to schedule, may have lacked something in the form of motivation for a career in nursing. Speculatively, it could be that these students either consciously or unconsciously may have "wanted" to be rejected and answered the NAI on that basis.

Discussion Concerning the Prediction of Course Grades and Semester Averages

The study of the multiple prediction of course grades and semester averages with cognitive, affective, and biographical variables in the five Purdue University Nursing Education Programs revealed that quite high prediction efficiency can be achieved with the battery of 29 variables which was used. The 29 variables represented scores all of which could be obtained at or prior to a student's admission. Hence prediction could be undertaken early enough to be useful in planning remedial instruction which might prevent failure in specific courses or an overall low semester average.

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APPENDIX 1

NORMATIVE STANDARDS FOR NES-NSC TOTAL AND NES-NSC AREA SCORES BASED ON 686 RECORDS

Percentiles	Nursing	Self	Home-Family	Responsibility	Others-Love-Marriage	Academic	NES Total Scores
99	12	26	11	17	15	14	85
95	10	25	9	16	13	12	82
90							81
85		24		15			79
80			8			11	78
75					12		
70							
65	9			14			77
60		23					
55							76
50						10	
45					11		75
40				13			
35			7				74
30		22					
25	8					9	73
20							
15				12	10		72
10	7	21				8	71
5		20	6	11	9		70
1	6	19		10	8	7	68

APPENDIX 2

NORMATIVE STANDARDS FOR NES-NAI (FORM I) TOTAL AND NES-NAI-AREA SCORES BASED ON 463 RECORDS

Percentiles	Nursing	Self	Home-Family	Responsibility	Others-Love-Marriage	Academic	NES Total Scores	Verification	
								V-1	V-2
99	12	27	11	17	16	13	84	34	19
95	11	24	10	16	14	12	80	31	16
90		23			13		79	29	14
85	10		9	15		11	78	28	13
80		22						27	12
75							77	26	11
70								25	10
65						10	76	24	
60		21	8	14	12		75	23	9
55	9								
50								22	8
45							74		
40								21	7
35		20		13			73		
30			7					20	
25	8					9	72	19	6
20		19			11			18	5
15				12			71	17	
10		18					70	16	4
5	7		6	11	10	8	69	14	3
1	6	17		10			66	11	1

APPENDIX 3

NORMATIVE STANDARDS FOR NES-NAI (FORM II) TOTAL AND NES-NAI-AREA SCORES BASED ON 385 RECORDS

Percentiles	Nursing	Self	Home-Family	Responsibility	Others-Love-Marriage	Academic	NES Total Scores	Verification	
								V-1	V-2
99	12	25	10	17	15	14	83	37	16
95	10	24	9	16	14	13	80	33	13
90	9					12	79	32	12
85		23					78	30	11
80			8	15	13			29	10
75							77	28	9
70	8	22				11		27	8
65							76		
60								26	
55				14			75		7
50					12			25	
45		21					74	24	
40						10		23	6
35	7								
30			7	13			73	22	
25		20						21	5
20						9	72	20	
15					11		71	19	4
10		19		12		8	70	17	3
5		18			10		69	15	2
1	6	17	6	11		7	67	13	1